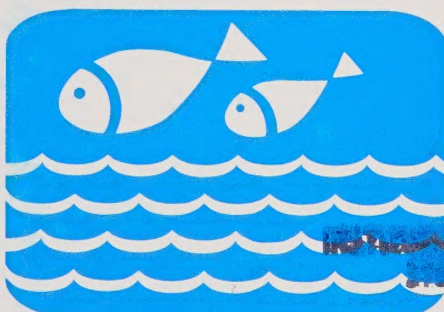
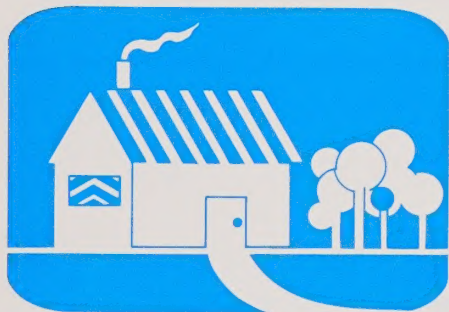
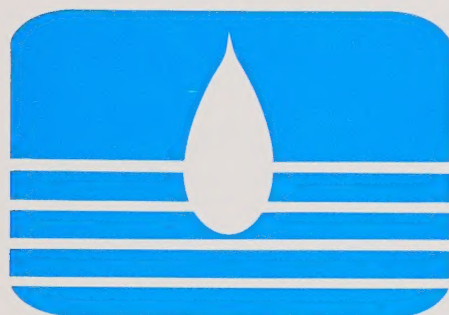


Draft
Environmental Impact Report

Hamilton Field Master Plan and Redevelopment Plan



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HAMILTON FIELD MASTER PLAN
& REDEVELOPMENT PLAN
MULTIPLE USE PROJECT
DRAFT
ENVIRONMENTAL IMPACT REPORT

July, 1988

Prepared For

THE CITY OF NOVATO

By


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HAMILTON FIELD MASTER PLAN
DRAFT ENVIRONMENTAL IMPACT REPORT

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PREFACE

PURPOSE OF EIR

This Environmental Impact Report (EIR) was prepared in conformance with the provisions of the California Environmental Quality Act, Guidelines as amended, and the City of Novato Environmental Review Guidelines.¹ The purpose of the EIR is to provide the City of Novato, public agencies and the public in general with detailed information about the environmental effects of the proposed Hamilton Field Master Plan project, to examine and institute methods of mitigating any adverse impacts should the project be approved, and to consider alternatives to the project as proposed. The law itself (CEQA) provides that public agencies should not approve projects as proposed until all feasible means available have been employed to substantially lessen the significant effects of such projects. "Feasible" means capable of being accomplished in a successful manner within a reasonable period of time.²

The EIR will be considered at public hearings by officials of the City of Novato, acting as Lead Agency, prior to any decision being made on the Hamilton Field Master Plan project. The EIR specifically addresses the Hamilton Field Master Plan in the form in which it was submitted to the City of Novato. Mitigation measures, or methods to reduce potential impacts that are proposed by the project sponsor, are so noted in the EIR. Certification of the Final EIR by the Novato City Council does not grant any approvals to the project. The merits of the Master Plan project will be considered by the Planning Commission and City Council after certification of the EIR.

EIR FORMAT

Three development alternatives to the Hamilton Field Master Plan project are evaluated throughout the body of the EIR. The alternatives, as defined further in this EIR, include variations in the number of dwelling units and employment base that could be accommodated on the project site. Each technical section of the EIR, for example Air Quality or Utilities, examines the proposed Master Plan project and the alternatives so

that a comparison between the impacts and mitigation measures for the project and each alternative may be made. It should be noted that the alternatives were developed by the City of Novato, Department of Community Development, and are considered by the City as reasonable, meaning that they could feasibly attain the basic objectives of the project as proposed. However, none of the alternatives is considered a preferred alternative at this time. This EIR is the document to be used to evaluate the relative merits of the alternatives as compared to the Master Plan Project as proposed. The order of discussion of the Master Plan Project and alternatives in each technical section of the EIR is as follows: Proposed Project; Alternative 1: Decreased Housing, Increased Jobs; Alternative 2: Decreased Housing, Decreased Jobs; Alternative 3: Increased Housing, Decreased Jobs. The alternatives are defined in further detail in Section 2, Project Description, Part 2.6, Alternatives to the Proposed Project.

¹State of California, Office of Planning and Research, CEQA: The California Environmental Quality Act, Law and Guidelines, June, 1986.

City of Novato Environmental Review Guidelines -- APPENDIX H, Procedures for EIR Preparation, October 25, 1983.

²21061.1, CEQA, The Law.

I

INTRODUCTION

INTRODUCTION

EARLIER MASTER PLAN AND EIR

In December of 1985, a Master Plan proposal prepared for the development of Hamilton Field was officially submitted to the City of Novato for review and approval. A Draft EIR was issued on the project in December of 1986, with the City of Novato serving as Lead Agency. The Master Plan proposal provided for 2,500 dwelling units and 4,082,000 square feet of floor area for office, research and development, commercial and warehousing space capable of supporting 11,100 jobs. Public hearings were held on the Draft EIR in February and March of 1987. At the conclusion of the third hearing on March 2, it was determined by the project sponsor that a revised Master Plan application would be prepared and submitted to the City for review which would recognize and incorporate the mitigation measures proposed in the 1986 EIR.

NOTICE OF PREPARATION

The current Hamilton Field Master Plan project proposal, the subject of this EIR, was submitted in its final form to the City of Novato in early September of 1987. A Notice of Preparation that an EIR would be prepared for the project was issued by the City of Novato on September 28, 1987. In response to the Notice, letters of comment were received from agencies and individuals outlining the concerns and issues that should be studied in the EIR. Numerous comments in the letters were noted as requiring a response in the EIR. More specifically, letters were received from:

- o The National Oceanic and Atmospheric Administration
- o U.S. Fish and Wildlife Service
- o Bay Conservation and Development Commission
- o California Department of Transportation
- o Metropolitan Transportation Commission
- o Naval Facilities Engineering Command
- o Novato Sanitary District
- o Novato Police Department

- o Marin County Planning Department
- o Marin/Sonoma Mosquito Abatement District
- o Marin Municipal Water District
- o Marin Community College
- o U.S. Army Corps of Engineers
- o Black Point Improvement Club
- o Lanham Village
- o Novato Fire Protection District
- o Department of the Navy
- o Marin Auditor-Controller
- o Bay Area Air Quality Management District
- o Mr. Paul Gurian, City of San Rafael Planning Department
- o Marin Local Agency Formation Commission
- o The California Office of Planning and Research

It should also be noted that approximately 75 letters were received containing commentary on the earlier Draft EIR from the above as well as other sources. The letters contained 549 comments. Those comments, as well as comments resulting from issuance of the Notice of Preparation, have been considered in preparing this Draft EIR. A public and agency EIR scoping meeting was conducted on November 10, 1987 to provide additional information on what issues should be addressed in the EIR. Comments from the scoping meeting were also considered in preparing this Draft EIR.

TECHNICAL BACKGROUND DOCUMENTS

A number of Technical Background Documents were assembled during preparation of the EIR. The Technical Background Documents are cited as references at various parts of the EIR and provide technical support and documentation for the conclusions contained in the EIR. The Technical Background Documents are available for public inspection at the Novato Department of Community Development, 901 Sherman Avenue, Novato, California 94947.

SUMMARY

Section 1 of this EIR, Summary, provides at one location the major findings and conclusions contained in the EIR. A matrix is used to assist the reader in comparing the impacts and mitigation measures of the Hamilton Field project and three alternatives studied in parallel with the project (see Section 2, Project Description). It should be noted that the Summary does not contain all impacts and mitigation measures described in the EIR. Each technical section of the EIR should be reviewed to gain a full understanding of

the impacts and mitigation measures applicable to the Hamilton Field project and the three alternatives studied.

In addition, each technical portion of the EIR in Section 3, entitled **Environmental Setting, Impacts and Mitigation Measures**, contains a summary matrix specifically relating to the topic being studied, i.e., Public Services, Energy, Noise and other subject categories. The summary matrices do not include all impacts and mitigation measures, but synthesize the major findings of each technical section. Each technical section should be reviewed in its entirety to secure a full understanding of the impacts and mitigation measures germane to the area of investigation.

REDEVELOPMENT

Redevelopment Plan

The Novato Redevelopment Agency is currently investigating the formation of a Redevelopment Project Area to include the proposed project site. This is in response to the project sponsor's request to form a Redevelopment Project Area. The Redevelopment Agency has prepared a proposed Redevelopment Plan for Novato Redevelopment Survey Area No. 3.¹

Accordingly, this EIR has been prepared for the Novato Redevelopment Agency in conformance with the California Community Redevelopment Law and the Redevelopment Agency's adopted procedures for the preparation, processing and review of environmental documents. In accordance with the above, all public and private activities and undertakings pursuant to or in furtherance of a Redevelopment Plan constitute a single project and require only one EIR. Individual redevelopment actions may be the subject of Initial Studies and subsequent environmental documents, including Negative Declarations and EIRs, if the specific activity would create impacts not addressed in the EIR on the Redevelopment Plan. This EIR is intended to contain sufficient analysis to allow adoption of the Redevelopment Plan and implementation of the individual public works and other development projects that will occur during implementation of the Redevelopment Plan.

The Initial Study on the Redevelopment Plan along with the Notice of Preparation was issued by the City of Novato on March 25, 1988. Responses to the Notice of Preparation

from agencies and individuals were received, and the questions and comments contained in those responses are addressed in this EIR. In summary, the EIR serves as the EIR for the Hamilton Field Master Plan and General Plan Amendments, and the Redevelopment Plan.

It should be pointed out that a Redevelopment Plan does not itself implement any specific land use development. The Redevelopment Plan is a vehicle to allow the implementation of a future project. The EIR addresses both the beneficial and adverse impacts of implementing the Redevelopment Plan. The costs/revenues and financial feasibility of implementing the Redevelopment project will be addressed in a separate document called the Report to Council which will incorporate the Redevelopment Plan EIR.

The Redevelopment Plan and Draft EIR are being circulated simultaneously for public review and comment. The Draft EIR is subject to a 45-day comment period. All comments received by the Redevelopment Agency of the City of Novato will be incorporated and addressed in the Final EIR.

Redevelopment Public Improvements

Existing improvements within Hamilton Field project boundaries were constructed over the past 50 years, to various federal government specifications, to be owned, operated and maintained by federal agencies. Redevelopment will require services to be provided by appropriate public agencies and utility companies, in accordance with respective current codes. Existing improvements do not meet current code, are considered substandard, and thus unacceptable for ownership or maintenance by the responsible agencies and utility providers.

Those areas lying within the Hamilton Field boundaries, and outside the proposed Master Plan area, will continue to be owned and operated by the federal government. While no street improvements are envisioned for that area in conjunction with the redevelopment project, it is quite possible water, gas, power or other utility systems could be "looped," or otherwise improved within the federal property concurrent with redevelopment. Substantial flood control and drainage improvements are proposed to occur within the federal property.

The following is a preliminary listing of potential public improvements that the private sector, acting alone, cannot feasibly implement. These improvements are contemplated in the proposed Redevelopment Plan for Hamilton Field Project Area to eliminate its blighted conditions:

- o Modification and widening of the Ignacio Boulevard bridge over U.S. 101 to eliminate the existing eastbound left-turn lane onto northbound U.S. 101 and provide on additional travel lane.
- o Construction of a new northbound on-ramp to U.S. 101 from Nave Drive at the location of the existing northbound off-ramp.
- o Reconstruction and widening of Nave Drive between the Alameda del Prado and Ignacio Boulevard interchanges.
- o Signalization of several critical intersections.
- o Reconstruction, upgrading and/or new road construction activities to provide access to new development sites within the Hamilton Field Revised Master Plan area and to accommodate future traffic generated by that development.
- o Necessary filling within existing and proposed street rights-of-way and within areas proposed for future private development.
- o Construction of areawide surface and subsurface storm drainage improvements within public lands or within public rights-of-way.
- o Cut and cap existing utility lines and provide completely new utility infrastructure improvements (i.e., possible new water storage tanks and transmission lines for domestic usage and fire flow requirements, sanitary sewer pumping stations and force and gravity mains).
- o Rehabilitate existing fire/rescue building.
- o Demolish identified structures to abate public health and safety hazards attendant to structural design deficiencies and/or presence of asbestos laden materials and to eliminate nuisance posed by juveniles using abandoned buildings.

CALTRANS PROJECT STUDY REPORT

During preparation of the EIR, it was recognized that the California Department of Transportation (CalTrans) should be involved to ensure that CalTrans freeway and interchange planning criteria were fully understood, and that procedures and timing for implementing any necessary freeway and interchange improvements for the Hamilton Field project could be successfully coordinated. Accordingly, a traffic study is being finalized for a CalTrans Project Study Report (PSR), which is the first step required to

implement freeway improvements. The PSR is currently being prepared in cooperation with the City of Novato and its consultants, but at the time of EIR preparation, the PSR has not been published.

PSRs are internal CalTrans documents that evaluate alternative geometrics, estimate costs and identify any potential environmental impacts of the potential improvements that would need to be further evaluated in subsequent environmental documentation. CalTrans District 4 will use the PSR to obtain conceptual approval from CalTrans headquarters of those improvements to CalTrans facilities considered necessary for the Hamilton Field project.

¹City of Novato, Redevelopment Agency, Novato Redevelopment Survey Area No. 3, Hamilton Field and Related Properties, Condition Review and Cost Estimate, April, 1988.

SUMMARY

1 SUMMARY

1.1 PROJECT DESCRIPTION

Location and Components

Located entirely within the City of Novato in Marin County, California, the former Hamilton Air Force Base lies at the western shore of San Pablo Bay approximately four miles south-southeast of the Novato Central Business District.

The proposed Hamilton Field project site is situated between the Hamilton Field runway to the east and U.S. Highway 101 to the west. The project sponsor, the Berg-Revoir Corporation, proposes: "to develop Hamilton Field as a premier mixed-use community of significant economic, social and environmental benefit to the City of Novato, to Marin County, and to the nearby region," and further, "to achieve an optimum jobs/housing balance as a solution to current and prospective transportation needs."¹

The Land Use Diagram prepared by the Berg-Revoir Corporation illustrates the general land use categories proposed for development, including Housing, Office/Research and Development, and Open Space. Overall, the project has been reduced in magnitude and scope from the 1985 Master Plan proposal to decrease off-site traffic and housing impacts by increasing on-site housing and providing fewer employment-generating land uses. The Land Use Diagram does not illustrate detailed building locations. Detailed building locations would be determined as various site-specific portions of the project are planned for development in accordance with the proposed construction schedule. Retail services, health facilities, daycare centers and other support facilities would be included in the project. To mitigate potential traffic and transportation impacts, a transit station is proposed on the project site coinciding with possible development of the Northwestern Pacific Railroad right-of-way as a transit corridor. Modifications to the Ignacio Boulevard/U.S. 101 interchange area, including lane restriping and altering the Enfrente Drive/Ignacio Boulevard intersection, would be required.

The 452.1-acre project would consist of 3,550 rental dwelling units; 2,030,000 gross square feet of office, R&D, and warehousing space; 420,000 gross square feet of hospital, nursing and medical office space; 450,000 gross square feet of retail/hotel space; 71 acres of open space; and support facilities consisting of daycare centers, recreation facilities, and museum.

Included in the 452.1 acres noted above are military land inholdings of 50.7 acres which are being negotiated for purchase by the Berg-Revoir Corporation.

SUMMARY OF PROPOSED DEVELOPMENT

<u>Land Use</u>	<u>Gross Square Footage</u>
Housing: 3,550 Units	2,790,000
Office/R&D/Warehousing	2,030,000
Hospital/Health Care	420,000
Retail/Hotel	450,000
Open Space	--
Roads	--
Total Project	5,690,000

The project would include providing new and upgraded physical improvements under a proposed Redevelopment Plan, rehabilitating existing buildings, removing existing barracks and constructing new buildings. Approximately 7,300 jobs would be created on the project site with the majority employed in finance, insurance, real estate, telecommunications, manufacturing, R&D and health care occupations. Other jobs would include personal services, professionals (legal, design, engineering), business and retail positions.

Scheduling

The project sponsor is proposing that the development of Hamilton Field proceed in three identifiable phases over a period of about ten years. Development progress would depend

on market demand. The phased construction areas are planned to be subdivided into smaller scale Precise Development Plans illustrating in greater detail building locations, circulation patterns, open space uses and other details of site development prior to preparing design and engineering construction drawings.

Required Approvals

The project site is zoned Planned Community (P-C) District and is designated as lying within the Ignacio-Hamilton Subcenter. The surrounding area is designated Infill within the Subcenter on the Novato General Plan Map. The project would require a General Plan amendment and Master Plan approval from the City of Novato. Further steps in the City Planning approval process, Design Review and building permits would be required before construction. Amendments to the General Plan would be required based on the interpretation and application of the general policies, criteria and standards as applied to the project proposal.

The project would require approvals from other agencies, including: 1) the Novato Fire Protection District; 2) the Novato Sanitary District; 3) Marin Local Agency Formation Commission (LAFCO) for annexations to the above districts; 4) the California Department of Transportation (CalTrans) for encroachment and construction permits within the Highway 101 right-of-way; 5) the California Department of Fish and Game for a creek alteration permit; and 6) the U.S. Army Corps of Engineers for permits related to floodplain protection and management and drainage improvements. The project site is not within the zone of ordinary jurisdiction of the San Francisco Bay Conservation and Development Commission (BCDC).

1.2 IMPACTS AND MITIGATION MEASURES

Traffic

Because of public concern regarding traffic along the Highway 101 corridor in Marin and Sonoma Counties, transportation is universally agreed to as being the most important issue respecting the development of Hamilton Field. With the extent of development proposed for Hamilton Field and the corresponding potential for the project to accommodate over 7,300 positions in employment, project-induced traffic during the AM and PM peak commute hours could be considered significant unless mitigation measures to

reduce peak-hour commute traffic were incorporated into the project. However, as noted previously, the current Master Plan proposal has been reduced in magnitude and scope from the 1985 Master Plan proposal in the effort to reduce traffic impacts.

Future Trip Generation and Distribution

In the absence of sufficient current data to predict project-induced traffic on the local highway network, several studies were undertaken to determine future trip generation by the project as outlined below:

- o Market support for the proposed project was determined by conducting market surveys.
- o Potential on-site employment at full buildout was determined by conducting employer surveys.
- o The type of workers who would work at Hamilton (i.e., professional, technical, clerical) was determined by percentage category based on the employer surveys.
- o Existing travel patterns to jobs in Novato were determined based on the employer surveys.
- o Where project workers would live was estimated based on resident household income surveys, current housing costs and projected housing growth.

Based on projected residential location patterns, it was determined that 27% of the project workforce would come from Novato (on-site and elsewhere in Novato), 41% would come from the northern counties (Sonoma, Napa, Solano), 27% would come from south Marin and San Francisco, and 5% would come from the East Bay area.

The next step was to determine the proportion of Novato workers who would live on the project site. Based on the relative availability of housing on-site and elsewhere in Novato, it was calculated that about 16% of the Hamilton workforce would live in the rental and for sale units on the project site. The number of project workers that would not live on the project site was calculated and their commute patterns determined, based on resident surveys.

Based on the market demand and resident surveys noted above, potential traffic impacts resulting from the proposed project were predicted. Mitigation measures to be incorporated into the project to reduce traffic impacts were accounted for, including a

Transportation Systems Management (TSM) program to increase vehicle occupancy rates and spread travel demand over a period of time rather than concentrating demand in a peak period, and proposed local roadway improvements. It was estimated that a maximum 18% reduction in vehicle trips generated by the project could be achieved through a TSM program and public transit use. Traffic impacts were predicted as follows:

- o Trip generation rates were calculated by land use category (Hotel, Office, Research and Development).
- o Project traffic generation volumes were calculated based on trip generation rates multiplied by the square footage of the proposed land uses.
- o Trip generation volumes were reduced by 18% to account for TSM and transit use.
- o Travel patterns for project workers were estimated based on previous studies that determined existing commute patterns.

The primary transportation impacts of the project relate to impacts on Highway 101, and impacts on the local Novato street system. These impacts were considered in conjunction with the anticipated cumulative growth of Marin and Sonoma Counties as estimated by ABAG Projections '87. Standard vehicular trip generation rates as identified in research conducted by the Institute of Transportation Engineers and CalTrans were applied to the proposed project land use types and quantities.

The project, when fully developed and occupied, would generate external to the site approximately 4,020 vehicular trips during the morning peak hour and 4,570 trips during the afternoon peak hour. This estimate includes freeway trips in both directions and trips on local streets. These trip generation estimates include consideration of an overall 18% peak hour trip reduction due to the combined effects of the TSM plan proposed as part of the project and the development of a transitway in the U.S. 101 corridor. The impacts of the project without the TSM and transit elements were also evaluated.

U.S. 101 Impacts. Although the recently constructed freeway improvements between San Rafael and State Route 37 have provided some relief, traffic conditions on U.S. 101 during the morning and afternoon peak commute periods in the peak travel direction continue to be poor. In the morning, the southbound 101 traffic in the vicinity of the site is characterized by slow moving stop-and-go traffic conditions resulting from bottlenecks south of Novato in northern San Rafael. In the afternoon, northbound freeway traffic

flow approaching the capacity of the freeway, averages 25-35 miles per hour. North of Novato, the point where the freeway narrows from three to two northbound lanes, has become a bottleneck creating traffic backups and delays in northern Novato during the peak period. Figure 1-1 presents a graphic summary of the freeway impacts of the Project plus cumulative growth. In the morning peak hour, the Project would add 1,140 southbound vehicles to U.S. 101 immediately north of Ignacio Boulevard. This added traffic would not exceed the capacity of the southbound freeway including currently programmed improvements near the site, but would aggravate the queuing on the freeway due to the bottlenecks to the south. In the afternoon peak hour, the project would add 1,390 vehicles to the northbound freeway north of Ignacio Boulevard, approaching the programmed capacity of the freeway immediately north of the site. Further north near the Sonoma/Marin County line, the added traffic would result in freeway volumes in excess of the two lane capacity of the freeway. Project plus cumulative traffic volumes on this section of the freeway will require the widening of this section of U.S. 101 to six lanes (three in each direction) consistent with the 101 Corridor Committee, and the Sonoma County General Plan traffic studies which call for six lanes within Sonoma County prior to the year 2005.

Local Street Impacts. Development of the transportation analysis was closely coordinated with an ongoing effort being undertaken by the city of Novato in support of the preparation of a Project Study Report (PSR) by CalTrans. The intent of the PSR is to define for the purpose of further design and environmental studies those roadway, freeway interchange, and freeway mainline improvements needed to accommodate the future traffic volumes which can be anticipated over a 20-year planning horizon due to expected regional and local growth.

The ongoing PSR traffic analysis has identified a series of freeway ramp and local street improvements (defined further in this EIR). These improvements will be necessary to accommodate the added project and cumulative traffic and to prevent disruption of mainline U.S. 101 freeway conditions due to the freeway ramp traffic movements. With these improvements, the local streets and intersections would all operate within acceptable levels of service. If the programmed and planned improvements to the freeway plus the transitway or proposed McInnis Parkway extending from near the Marin Civic Center in the south to Highway 37 in the north are not implemented, diversion of freeway traffic onto local streets is likely to increase, compounding an existing problem.

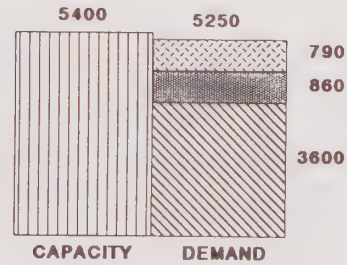
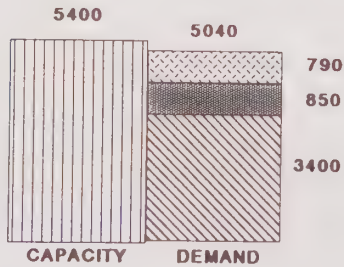
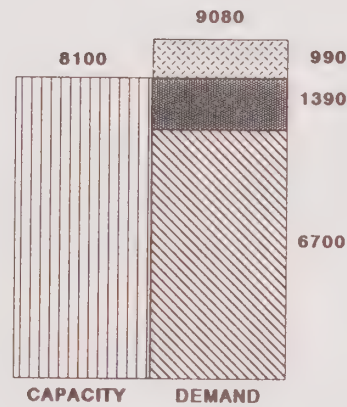
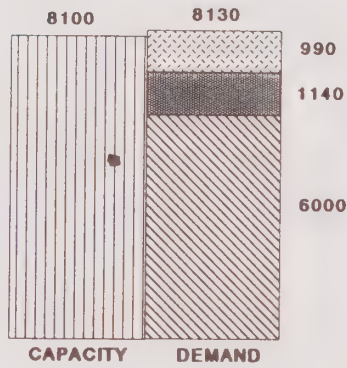
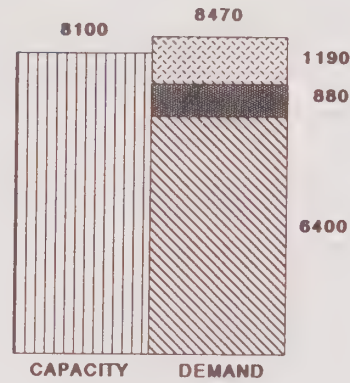
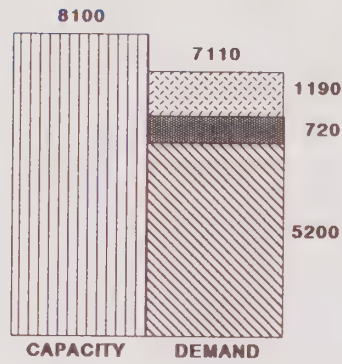
SOUTH OF ALAMEDA DEL PRADO

BETWEEN IGNACIO AND S.R. 37

NORTH OF COUNTY LINE

AM PEAK HOUR VEHICLE TRIPS (SOUTHBOUND)

PM PEAK HOUR VEHICLE TRIPS (NORTHBOUND)



 HAMILTON
  EXISTING
  CUMULATIVE

HAMILTON FIELD
MASTER PLAN
EIR

U.S. 101 IMPACTS
CUMULATIVE TRAFFIC
WITH PROJECT
(YEAR 1997)



FIGURE 1-1

1.3 ALTERNATIVES TO THE PROPOSED PROJECT

As defined further in Section 2, Project Description, three alternatives to the proposed project are evaluated in parallel with the project in each technical section of this EIR. The alternatives are defined as:

ALTERNATIVE 1: DECREASED HOUSING, INCREASED JOBS

ALTERNATIVE 2: DECREASED HOUSING, DECREASED JOBS

ALTERNATIVE 3: INCREASED HOUSING, DECREASED JOBS

The alternatives would differ from the project as proposed in the following ways:

Alternative 1 would add 200,000 square feet of office space and decrease the residential count by 300 units.

Alternative 2 would remove 400,000 square feet of medical, hotel, retail, warehouse and light industrial space from the project, and decrease the residential count by 1,550 units.

Alternative 3 would remove 1,200,000 square feet of R&D, medical, hotel, retail warehouse and light industrial space from the project, and increase the residential count by 200 units.

The following matrix serves to compare the impacts and mitigation measures of the project and each of the three alternatives. The matrix is arranged so each of the alternatives may be compared to the project as proposed. It should be noted that the technical sections in Section 3 of this EIR, Environmental Setting, Impacts and Mitigation Measures contain substantial additional and clarifying information relative to the impacts and mitigation measures for the proposed project and three alternatives studied.

In addition, Section 6 of the EIR briefly investigates other alternatives, including alternatives that were studied by the project sponsor, but rejected in favor of the project as currently proposed. Section 6, titled Alternatives to the Proposed Project is required under the provisions of the California Environmental Quality Act as explained in Section 6, and includes an evaluation of the No Project Alternative.

SUMMARY COMPARISON OF IMPACTS AND MITIGATION MEASURES

LAND USE

POPULATION, EMPLOYMENT, AND HOUSING JOB GROWTH

POPULATION, EMPLOYMENT, AND HOUSING GROWTH OF DWELLING UNITS

	IMPACT	MITIGATION	IMPACT	MITIGATION	IMPACT	MITIGATION
PROPOSED PROJECT	Should the military inholdings not be secured by the project sponsors, project development surrounding the inholdings could be precedent setting on the ultimate use and development potential of the inholdings.	To develop the site as a whole, including the military inholdings, would provide the opportunity to avoid discrepancies in function between adjacent parcels and allow for the coordination of site development that reduces or eliminates land use conflicts. Periodic updates on status of proposed land development surrounding the project site should be completed to avoid potential conflicts in land use.	The proposed project would build out 2.9 million square feet of business space which will lead to the formation of 7,170 new jobs, and an additional 14,170 secondary jobs. New business formation will require the City of Novato to pay for and provide a variety of new support services such as additional fire services, police services, and an expanded solid waste disposal system, the construction of a new storm drainage system, and the expansion of the sewage treatment system.	The project sponsor should work with the City of Novato and appropriate special districts to ensure that an adequate supply of public services needed to support the job growth can be provided. The project sponsor should also work with the Marin County Private Industry Council and the California Employment Development Department to assist local residents to be trained and placed in jobs at the project site.	The proposed project would build 3,550 new housing units and require that the City build an additional school, plan for the increased usage of existing schools, expand parks and recreation services, and build an additional library. The construction of the new housing combined with the construction of space for office and industry also contribute to the need for the City to expand additional services such as fire, police, solid waste, storm drainage, and sewer.	The project sponsor should work with the City of Novato and appropriate special districts to ensure that an adequate supply of public services needed to support the new housing can be provided.
ALTERNATIVE 1: (Decreased Housing, Increased Jobs)	Impacts would be the same as for the proposed project.	Mitigation would be the same as for the proposed project.	Project Alternative #1 would build out 3.5 million square feet of business space which will lead to the formation of 7,760 new jobs, and an additional 15,740 secondary jobs. This represents a 20% increase in space constructed for office and industry beyond the proposed project. New business formation would require the City to provide services described above.	Mitigation would be the same as for the proposed project.	Alternative #1 would construct 3,250 new housing units, closely resembling the scale of construction for the proposed project. The City would need to provide the same level of services as described above with the proposed project.	Mitigation would be the same as for the proposed project.
ALTERNATIVE 2: (Decreased Housing, Decreased Jobs)	Impacts would be the same as for the proposed project.	Mitigation would be the same as for the proposed project.	Project Alternative #2 would build out 2.87 million square feet of business space which will lead to the formation of 6,430 new jobs, and 12,850 secondary jobs. The scale of business development proposed in Alternative #2 closely resembles that of the proposed project. The City would need to provide appropriate services described above.	Mitigation would be the same as for the proposed project.	Alternative #2 would substantially reduce the scale of new housing construction to 2,000 units. This alternative would put less pressure on the school system to increase usage. However, all other services described above will still need to be provided.	Mitigation would be the same as for the proposed project.
ALTERNATIVE 3: (Increased Housing, Decreased Jobs)	Impacts would be the same as for the proposed project.	Mitigation would be the same as for the proposed project.	Project Alternative #3 would build out 1.92 million square feet of new business space, which would lead to the formation of 4,670 new jobs, and 9,230 secondary jobs. This is a 34% percent reduction of the scale of the proposed project. Yet the City of Novato would still be required to provide adequate support services.	Mitigation would be the same as for the proposed project.	Alternative #3 would increase the number of new housing units built to 3,750. The City should provide the same level of services as described above.	Mitigation would be the same as for the proposed project.

SUMMARY COMPARISON OF IMPACTS AND MITIGATION MEASURES

POPULATION, EMPLOYMENT, AND HOUSING
HOUSING AFFORDABILITY

POPULATION, EMPLOYMENT,
AND HOUSING
POPULATION INCREASE AND
HOUSEHOLD FORMATION

POPULATION, EMPLOYMENT, AND HOUSING
JOBS / HOUSING BALANCE

	IMPACT	MITIGATION	IMPACT	MITIGATION	IMPACT	MITIGATION
PROPOSED PROJECT	The project would lead to a need for 570 more housing units in Novato than would be built at Hamilton Field, creating a net demand for additional housing, and driving Novato's market value housing prices upward. The set aside of 355 below market rate housing units would help keep prices down. The formation of 880 households in south Marin and 2,070 households in Sonoma Counties would also create additional demand for housing and incrementally drive market prices up in each jurisdiction.	The City should set aside 20% of the redevelopment revenue to implement the BMR program. The commitment for BMR should be extended from 20 to 30 years.	The proposed project would lead to the formation of 4,120 new households in Novato which exceeds the number of housing units built onsite by 570. Project would also lead to the formation of 880 new households in south Marin and 2,070 new households in Sonoma Counties. An expanded population would increase the pressure to provide affordable housing, and expand the demand for services.	The only available mitigation for these impacts is to reduce the project size. The project sponsor should work with the City of Novato and appropriate special districts to ensure that an adequate supply of public services needed to support the new housing can be provided.	The proposed project would produce more than twice as many jobs as housing units in Novato, it would shift the City's jobs / housing balance more closely toward the regional average, and shift Sonoma County's jobs / housing balance away from the regional average by stimulating the formation of new households.	Further imbalance in Sonoma County's jobs / housing balance can only be corrected by encouraging the creation of new jobs in Sonoma County. New job production in Novato will always create pressure on Sonoma County's housing market as long as Novato workers choose to seek housing in Sonoma County.
ALTERNATIVE 1: (Decreased Housing, Increased Jobs)	Alternative #1 would lead to a need for 630 more housing units in Novato than would be built at Hamilton Field, and create upward pressures on Novato's housing prices, even with the construction of 325 BMR units. Alternative #1 would also lead to the formation of 1,060 new households in south Marin, and 2,290 households in Sonoma Counties, and create upward pressure on housing prices in each jurisdiction.	Mitigation would be the same as for the proposed project.	Alternative #1 would lead to the formation of 3,880 households in Novato, exceed number of housing units built onsite by 630 units. Alternative #1 would lead to the formation of 1,060 households in south Marin and 2,290 households in Sonoma Counties.	Mitigation would be the same as for the proposed project.	Alternative #1 would create 2.5 times as many jobs as housing units in Novato, move Novato's jobs / housing balance more closely toward the regional average than the proposed project, and move Sonoma County's jobs / housing balance further away from the regional average than the proposed project.	Mitigation would be the same as for the proposed project.
ALTERNATIVE 2: (Decreased Housing, Decreased Jobs)	Alternative #2 would lead to a need for 522 more housing units in Novato than would be built at Hamilton Field, and create upward pressures on Novato's housing prices, even with the construction of 200 BMR units. Alternative #2 would also lead to the formation of 890 new households in south Marin, and 1,880 households in Sonoma Counties, and create upward pressure on housing prices in each jurisdiction.	Mitigation would be the same as for the proposed project.	Alternative #2 would lead to the formation of 2,520 households in Novato, and would exceed the number of housing units built onsite by 520 units. Alternative #2 would lead to the formation of 890 households in south Marin and 1,880 households in Sonoma Counties.	Mitigation would be the same as for the proposed project.	Alternative #2 decreases both jobs and housing, but 3.2 times as many jobs would be created as housing units built. It will shift Novato's jobs / housing balance more closely toward the regional average than the proposed project, and shift Sonoma County's jobs / housing balance away from the regional average.	Mitigation would be the same as for the proposed project.
ALTERNATIVE 3: (Increased Housing, Decreased Jobs)	Alternative #3 would lead to a need for 370 more housing units in Novato than would be built at Hamilton Field which will create upward pressures on Novato's housing prices, even with the construction of 375 BMR units. Alternative #3 would also lead to the formation of 540 new households in south Marin, and 1,360 households in Sonoma Counties, and create upward pressure on housing prices in each jurisdiction.	Mitigation would be the same as for the proposed project.	Alternative #3 would lead to the formation of 4,120 households in Novato, and would exceed the number of housing units built onsite by 370 units. Alternative #3 would lead to the formation of 540 households in south Marin and 1,360 households in Sonoma Counties.	Mitigation would be the same as for the proposed project.	Alternative #3 would create only 1.2 times as many jobs as housing units, moving Novato's jobs / housing balance more closely toward the regional average, and moving Sonoma County's jobs / housing balance away from the regional average.	Mitigation would be the same as for the proposed project.

SUMMARY COMPARISON OF IMPACTS AND MITIGATION MEASURES

TRAFFIC AND TRANSPORTATION

PUBLIC SERVICES
FIRE

PUBLIC SERVICES
POLICE

	IMPACT	MITIGATION	IMPACT	MITIGATION	IMPACT	MITIGATION
PROPOSED PROJECT	The proposed project would generate 66,100 daily trips. The greatest impact would occur during the PM peak hour in the northbound direction on Highway 101, where 1390 trips per hour would be generated on northbound Highway 101 between Ignacio Boulevard and State Route 37. The project would contribute substantially to needed local and regional transportation improvements.	The project sponsor should implement the planned TSM program and roadway improvements as well as other identified local roadway improvements or modifications. The right-of-way for a four-lane arterial (McInnis Parkway) should be reserved through the project that would be in alignment with the San Rafael Segment of the Parkway and would provide a feasible connection to the north. Provisions for a transit station on the NWPRR right-of-way would be maintained. Highway 101 widening would be necessary to the north of the site, although funding for Highway widening north of the State Route 37 interchange is uncertain. Finally, a plan should be developed to program for transportation impact fees in Marin and Sonoma Counties.	The construction of 3,550 new housing units and 2.9 million square feet of business space will require that a new fire station be established at Hamilton Field.	The project sponsor should pay for a proportionate share of the equipment and operation necessary for one engine at the fire station. Redevelopment would allow for the rehabilitation of a site and new fire station at Hamilton.	The proposed project will require that a new police patrol be established at Hamilton Field requiring a staff increase of 8 sworn officers and one additional position.	The project sponsor should provide private security services to supplement public police services. A traffic management system should be established to decrease the need for public traffic policing.
ALTERNATIVE 1: (Decreased Housing, Increased Jobs)	Alternative #1 would generate 66,500 daily trips. The greatest impact would occur during the PM peak hour in the northbound direction on Highway 101, where 1190 trips per hour would be generated on northbound Highway 101 between Ignacio Boulevard and State Route 37. Alternative #1 would contribute substantially to needed local and regional transportation improvements.	Mitigation would be the same as for the proposed project.	A decrease in the amount of housing and an increase in the amount of space constructed for business will still require a new fire station at Hamilton Field.	Mitigation would be the same as for the proposed project.	The level of development proposed in Alternative #1 will still require the establishment of a new police beat at Hamilton Field.	Mitigation would be the same as for the proposed project.
ALTERNATIVE 2: (Decreased Housing, Decreased Jobs)	Alternative #2 would generate 42,000 daily trips. The greatest impact would occur during the PM peak hour in the northbound direction on Highway 101, where 970 trips per hour would be generated on northbound Highway 101 between Ignacio Boulevard and State Route 37. Alternative #2 would contribute substantially to needed local and regional transportation improvements.	Mitigation would be the same as for the proposed project.	The construction of 2,000 new housing units and 2.87 million square feet of space for business development will still require that a new station be established at Hamilton Field.	Mitigation would be the same as for the proposed project.	The level of development proposed in Alternative #2 will still require the establishment of a police beat.	Mitigation would be the same as for the proposed project.
ALTERNATIVE 3: (Increased Housing, Decreased Jobs)	Alternative #3 would generate 62,800 daily trips. The greatest impact would occur during the PM peak hour in the northbound direction on Highway 101, where 940 trips per hour would be generated on northbound Highway 101 between Ignacio Boulevard and State Route 37. Alternative #3 would contribute substantially to needed local and regional transportation improvements.	Mitigation would be the same as for the proposed project.	More housing and less space for business development will still require the establishment of a new fire station at Hamilton Field.	Mitigation would be the same as for the proposed project.	The level of development proposed in Alternative #3 will still require the establishment of a new police beat.	Mitigation would be the same as for the proposed project.

SUMMARY COMPARISON OF IMPACTS AND MITIGATION MEASURES

HYDROLOGY

VEGETATION AND WILDLIFE

AIR QUALITY

	IMPACT	MITIGATION	IMPACT	MITIGATION	IMPACT	MITIGATION
PROPOSED PROJECT	<p>Site Drainage: Runoff volumes would increase and time of concentration would decrease with the addition of impervious surfaces, thereby aggravating existing on-site flooding conditions.</p> <p>Flood Protection: Parts of the project site would be subject to 100-year flooding.</p> <p>Water Quality: Dislodged soils from construction activities could increase turbidity of surface waters. Hazardous compounds from R&D industries and urban contaminants from developed areas could enter surface waters through the drainage system.</p>	<p>Pacheco Creek channel would be realigned and improved to accommodate additional runoff. High water levels in Pacheco Pond would be controlled by a weir, an overflow ditch and pumps to San Pablo Bay.</p> <p>If the existing levee around the airstrip is not repaired, a new levee would be built east and north of Hangar Row, and would have portable partitions to provide access to the runway. Flood control and drainage responsibility must be established to ensure maintainance of the facilities.</p> <p>Temporary and permanent erosion and sediment control systems would be incorporated in the development plans for the site. Installation and cleaning of catch basins would reduce the amount of urban contaminants entering the drainage system. Spill contingency systems would be incorporated in the R&D designs.</p>	<ul style="list-style-type: none">• Low level releases of toxic compounds into the nearby wetlands from urban runoff and possible large toxic spills.• Habitat conversion-filling of approximately 7 acres of wetlands with plans to re-create approximately 8 acres of wetland habitats.• Reduction of wildlife habitat and deer populations.• Human and domestic animal encroachment into wildlife areas.• Potential blocking of fish migration up Pacheco Creek.	<ul style="list-style-type: none">• Require detailed erosion control and toxic spill control plan and install sediment traps around parking lots. Require regular cleaning of paved areas, especially just prior to the rainy season.• Approve proposed wetlands mitigation plan with Master Plan and require submittal of detailed design information prior to project construction.• Wetland re-creation.• Control of human access into areas via trails, fences, & sufficient buffer areas.• Enforce restriction of pets outdoors near wetlands area.• Consult with DFG as part of the 1601-03 permit process on proper design of the realignment of Pacheco Creek.	<p>Construction activities would temporarily increase particulate and CO concentrations on and near construction sites and may result in violations of the Federal and State PM and CO standards.</p> <p>Vehicles would be the primary source of additional air pollutants resulting from project operation. Emissions of reactive organic compounds and nitrogen oxides from these sources would be considered a significant addition to County and Bay area totals.</p> <p>A worsening of existing eight-hour CO standard violations near the Ignacio Boulevard northbound on-ramps and the creation of new eight-hour CO standard violations near the intersections of Nave Drive with the three project access roads are projected.</p> <p>Toxic emission may occur from the R&D uses planned for the project site.</p>	<p>Demolition sites should be sprinkled with water continuously during demolition phases. Unpaved construction sites should be sprinkled with water at least twice per day. Stockpiles of soil, sand, and other such materials should be covered. Trucks hauling debris, soil, sand or other such materials should be also be covered. Streets surrounding demolition and construction sites should receive periodic maintenance.</p> <p>Mitigation measures, such as roadway improvements and TSM measures, to alleviate traffic impacts would also reduce air quality impacts. However, the projected 18% reduction in traffic generated by the project TSM measures would not be sufficient to reduce air quality impacts below the accepted levels of significance.</p> <p>Mitigation measures, such as roadway improvements and TSM measures, to alleviate traffic impacts would also reduce air quality impacts. However, the projected 18% reduction in traffic generated by the project TSM measures would not be sufficient to reduce CO impacts below the accepted levels of significance.</p> <p>All uses which may emit significant quantities of toxic pollutants should be covered by BAAQMD PSD permits. Such permits would regulate the emission levels of such pollutants and encourage the implementation of control measures, such as carbon absorption or catalytic oxidation of toxic vapors.</p>
Alternative 1: (Decreased Housing, Increased Jobs)	Impacts would be the same as for the proposed project.	Mitigation would be the same as for the proposed project.	Same as proposed project.	Same as proposed project. Increase office density and use reduced housing area for greater wetland mitigation areas or buffer areas.	Impacts would be the same as for the proposed project.	Mitigation measures would be the same as for the proposed project.
Alternative 2: (Decreased Housing, Decreased Jobs)	Impacts would be the same as for the proposed project.	Mitigation would be the same as for the proposed project.	Similar to the proposed project. With the reduced industrial use the potential for a toxic spill would be slightly less.	Same as the proposed project except reduction of housing and industrial areas rather than decreasing densities in same areas. These new areas can be used to expand the wetland mitigation and / or buffer areas.	Although a decrease in air pollutant emissions of about 30% would result from the implementation of this alternative, the levels of significance attached to the remaining emissions would be the same as for the proposed project.	Mitigation measures would be the same as for the proposed project.
Alternative 3: (Decreased Housing, Decreased Jobs)	Impacts would be the same as for the proposed project.	Mitigation would be the same as for the proposed project.	Same as Alternative 2 but to a lesser degree.	Same as Alternative 2 but more potential for greater wetland mitigation opportunities.	Impacts would be the same as for the proposed project.	Mitigation measures would be the same as for the proposed project.

To summarize, the alternatives in Section 6 included:

1. The No-Project Alternative wherein maintaining the project site in its current condition would preclude the identified impacts associated with the proposed project. The No-Project Alternative would also allow existing vacant buildings on the site, which could otherwise be renovated and reused, to deteriorate. Additionally, toxic materials cleanup could be deferred and there would remain the possibility that more military housing could be constructed on the site. Regional freeway improvements would still be needed for the study period including the improvement of U.S. 101 to six lanes north of the County line.
2. The City of Novato Adopted Land Use Plan Alternative would be similar to the proposed project but provide for a vehicular connection to Bel Marin Keys. With 10,000 employees, the Adopted Land Use Alternative would generate about 25% more traffic than the project along the U.S. 101 corridor. With 1,000 housing units, this alternative would not offer a jobs/housing balance sufficient to mitigate the generation of commute traffic, or mitigate the need for housing created by this alternative.
3. Other Alternatives studied by the project sponsor which were rejected by the project sponsor in favor of the project as currently proposed. These alternatives included:
 - o The All Residential Project which would consist of up to 8,000 housing units, significantly shift Highway 101 traffic impacts south of the site (instead of north of the site) during the AM and PM peak periods, and significantly increase the demand for police protection, fire protection, library and school services.
 - o The All Office/R&D/Commercial Development Alternative that would increase economic development in the area and increase tax revenues for local government while generating additional demand for housing.
 - o The Regional Shopping Center Alternative that would provide only a regional shopping center on the project site in conflict with the adopted Novato General Plan goals and policies for reuse of Hamilton Field.

¹Berg-Revoir Corporation, Hamilton Field Revised Master Plan, September 1, 1987, Project Description, pp. 4 and 5.

PROJECT DESCRIPTION

2 PROJECT DESCRIPTION

2.1 LOCATION

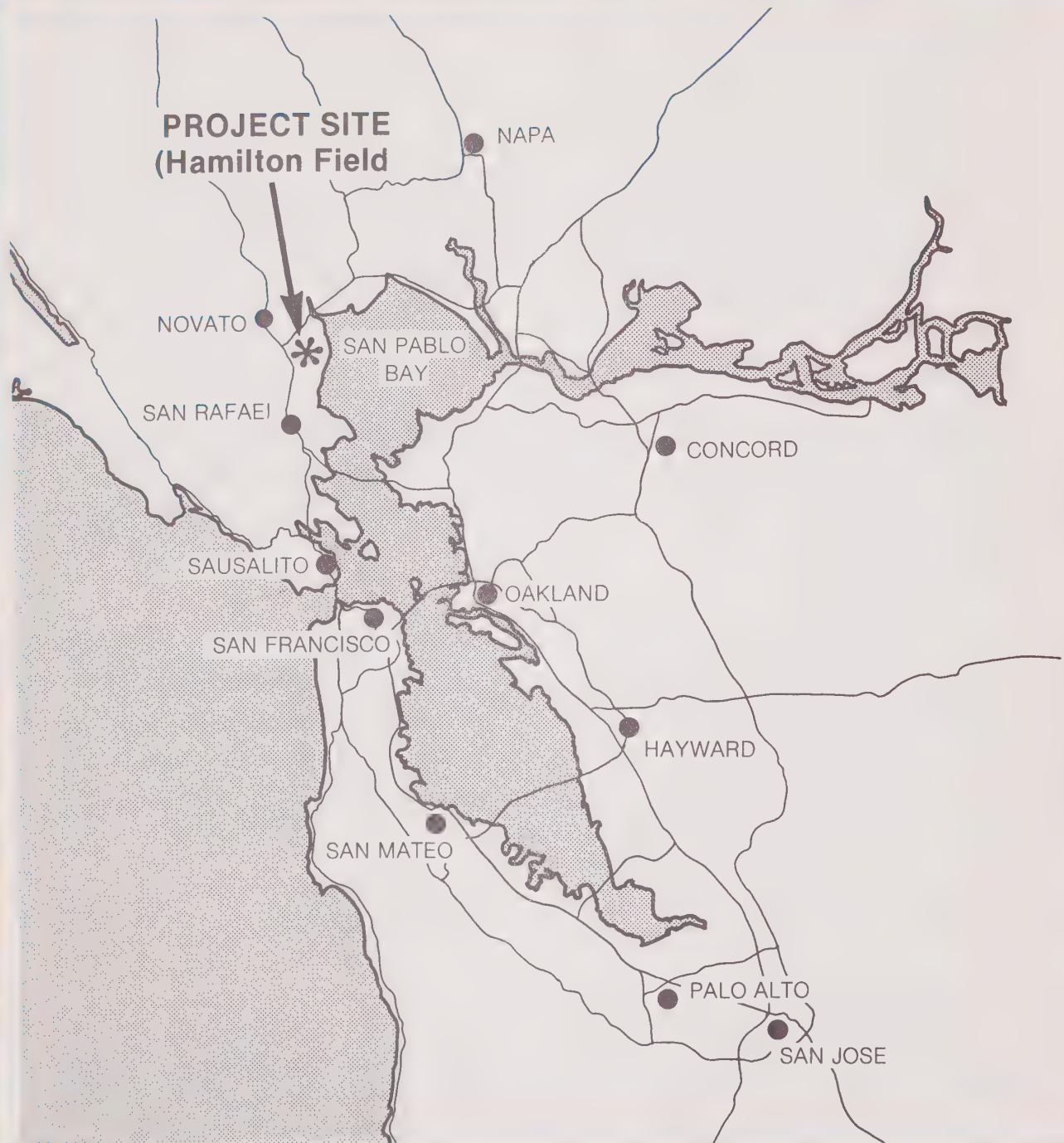
Located entirely within the City of Novato in Marin County, California, the former Hamilton Air Force Base lies at the western shore of San Pablo Bay approximately four miles south-southeast of the Novato Central Business District as shown on Figure 2-1, Regional Location Map.

The proposed Hamilton Field project site is situated between the Hamilton Field runways to the east and U.S. Highway 101 to the west. Access to the project site is from the Alameda Del Prado/U.S. 101 interchange to the south and the Ignacio Boulevard/U.S. 101 interchange to the north as shown on Figure 2-2, Site Location Map. As defined later in this portion of the EIR, the project site consists of approximately 452 acres out of the total 1,600-acre former Hamilton Air Force Base.

The project site is a portion of Assessor's Parcel Number 157-180-24.

2.2 PROJECT HISTORY

Construction of Hamilton Field began in 1931 (see Appendix A, History of Hamilton Field). With American entry into World War II, Hamilton Field was expanded to wartime status providing a base of operations for the Army Air Force. Decommissioning of Hamilton Field by the U.S. Air Force occurred in 1974. In 1977, the General Services Administration (GSA) undertook a review for the ultimate disposal of Hamilton Field. In mid-1983, 755 acres of Hamilton property were formally transferred to the Army for active and reserve use, including the 8,000-foot runway and taxiways, a large portion of the lowland area north of the runway and a large apron area around an aircraft hangar. About this time, the Navy submitted a request to the GSA for another 217 acres of property to meet the Navy's housing needs in the Bay Area. This left approximately 400



HAMILTON FIELD MASTER PLAN EIR

REGIONAL LOCATION MAP

FIGURE 2-1

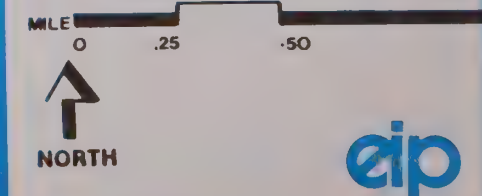


HAMILTON FIELD MASTER PLAN EIR

FIGURE 2-2



SITE LOCATION MAP



acres available for subsequent disposition by GSA for other uses, and in March of 1985, this land was offered at auction by GSA. The \$45,000,000 bid submitted by the Berg-Revoir Corporation was the successful bid leading to plans for the eventual transfer of title to this Corporation.

As transactions with the GSA were being processed, the Berg-Revoir Corporation (the project sponsor), set up headquarters at Hamilton Field and began the process of preparing an overall Master Plan for development. A number of technical and design consultants were hired to conduct studies relating to wetland habitat, traffic, economics, flood control, soils and geology, and planning and design. Meetings to review the Master Plan as it developed and to exchange ideas with citizens, representatives of citizen groups and public officials were conducted throughout preparation of the Master Plan. The original Master Plan was completed in late 1985, with the various technical study findings used as supporting documentation for the Master Plan proposal.

A community meeting was held in early 1986, wherein the original Master Plan was presented for review to the public and interested agency representatives. The original Master Plan, together with the requested Novato General Plan amendments, was officially submitted to the City of Novato for review and approval in December of 1985. Serving as Lead Agency, the City conducted an Initial Study to determine if an Environmental Impact Report (EIR) would be required for the proposed project as described in the original Master Plan, the construction of all land uses thereunder, and governmental approvals necessary for implementation of the Master Plan including General Plan amendments.

The findings of the Initial Study indicated that an EIR would be required for the project, and the Notice of Preparation was issued on December 17, 1985. Agency and public scoping sessions were held by the City of Novato on January 6 and February 10, 1986, respectively, to assist in determining the issues of concern to be studied in the EIR. A Draft EIR was issued on the project in December of 1986. Public hearings were held on the Draft EIR in February and March of 1987. At the conclusion of the third hearing on March 2, it was determined by the project sponsor that a revised Master Plan application would be prepared and submitted to the City for review which would recognize and incorporate the mitigation measures proposed in the 1986 EIR.

The current Hamilton Field Master Plan proposal, the subject of this EIR, was submitted in its final form to the City of Novato in early September of 1987. Recognizing the extent of off-site traffic impacts of the original Master Plan, Alternative A in the 1986 Draft EIR, which called for more housing and reduced employment generating uses, became the starting point for the project sponsor to develop a revised project retaining elements of the original Master Plan proposal.

The major changes in the current proposal, and as detailed further below, include increasing the number of dwelling units from 2,500 to 3,550 and decreasing the floor area of employment-generating land uses from 4,082,000 square feet to 2,900,000 square feet, thereby reducing the number of employees from 11,100 to about 7,300.

2.3 PROJECT OBJECTIVES

The project sponsor, the Berg-Revoir Corporation, desires to design and construct a mixed use community providing housing, retirement housing, commercial and industrial land uses, office buildings, medical facilities, day care facilities, convenience shopping, recreational facilities and related transportation and utility improvements. It is the project sponsor's expressed desire to provide opportunities for workers at all income levels, including the handicapped, to provide housing for moderate income residents, and to achieve a jobs-housing balance wherein most of the on-site residents would be able to secure employment at Hamilton Field. The project sponsor envisions the project as a regional employment center and has projected its earliest completion by 1997. It is the project sponsor's intent that the proposed project generally conform to the City of Novato's General Plan as proposed for amendment and to County of Marin General Plan policies.

As noted previously, the Novato Redevelopment Agency has prepared a proposed Redevelopment Plan, the objective of which is to eliminate blight, including an inadequate and obsolete infrastructure. It will be necessary to demolish more than 100 existing abandoned buildings containing approximately 660,000 square feet of floor area. In addition, large areas of asphalt and concrete paving will require removal. Redevelopment will require services to be provided by appropriate public agencies and utility companies, in accordance with current codes. Existing improvements do not meet current codes, are considered substandard, and thus unacceptable for ownership or maintenance by the

responsible agencies and utility providers (refer to Novato Redevelopment Survey Area No. 3 on file with the Novato Redevelopment Agency, including a detailed description of the proposed improvements).

2.4 PROJECT CHARACTERISTICS AND SCHEDULING

2.4.1 PROJECT CHARACTERISTICS

Proposed land uses are shown on Figure 2-3, Proposed Land Use Diagram. The primary land use categories include Residential, Office/R&D/Warehousing, Hospital/Health Care and Support Commercial. It should be noted that the land area for which the original bid was submitted by the Berg-Revoir Corporation includes 402 acres. The Corporation is currently engaged in negotiations with the military for an additional ten parcels of land totaling 50.7 acres for inclusion in the development area. The project site, as analyzed in this EIR, thus includes a total of 452.1 acres of land (see Figure 2-3, Proposed Land Use Diagram). If any of the ten parcels currently owned by the military were not acquired by the project sponsor, the proposed land use designations and any Master Plan approvals given the project by the City of Novato would not be effective with respect to the unacquired parcels.

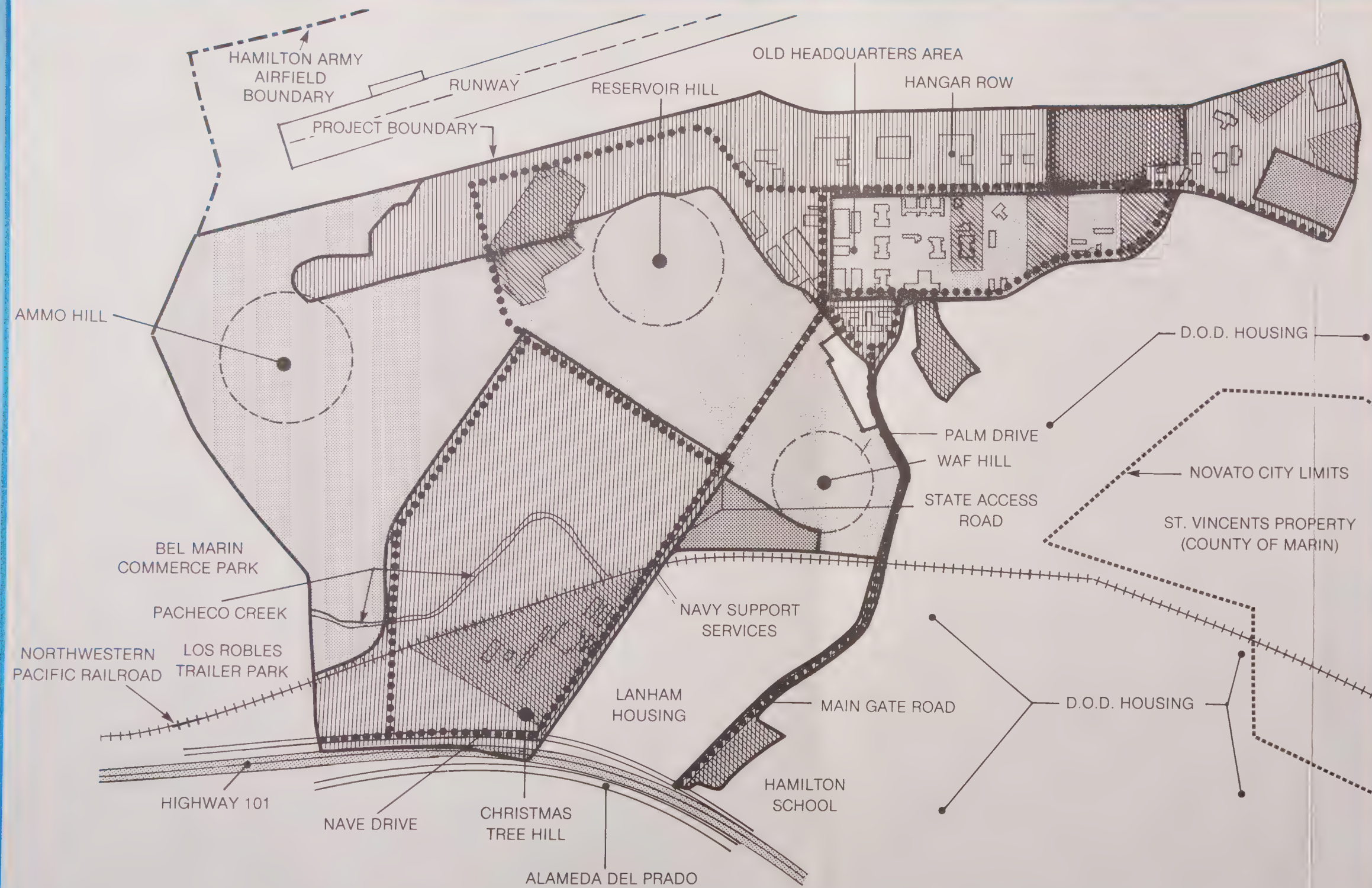
The Berg-Revoir Corporation expects that certain of the project's parcels may be sold to and developed by other developers. To the extent possible however, the Corporation intends to undertake build-to-suit buildings based on pre-leasing. Some portions of the project may be undertaken on a joint venture basis. The extent of sales versus lease versus joint venture development will depend on future market conditions and therefore cannot be precisely defined at this time. A Business Park Owners Association would be formed under a declaration of Covenants, Conditions and Restrictions (CC&Rs) guiding and controlling operation, maintenance and use of all non-residential improvements and areas within the project site, with provisions for joint management and operation with the residential areas' CC&Rs. The following describes the land uses proposed for the project. Table 2-1, Proposed Development, summarizes the gross square footage for each land use described. Table 2-2 summarizes acreage allocations by type of use.

TABLE 2-1
PROPOSED DEVELOPMENT

	<u>Units</u>	<u>Gross Square Footage</u>	<u>Gross Square Footage</u>
<u>Residential</u>			
Regular Rental Units (450 - 1000 sq. ft.)	2,600		2,080,000
Retirement Rental Units (450 - 750 sq. ft.)	550		330,000
For Sale Units (700 - 1400 sq. ft.)	<u>400</u>		<u>380,000</u>
TOTAL RESIDENTIAL	3,550		2,790,000
<u>Office/R&D/Warehousing</u>			
Office & Financial			690,000
Medical R&D		440,000	
Other R&D		<u>300,000</u>	740,000
Warehousing			300,000
Light Industrial			<u>300,000</u>
Subtotal			2,030,000
<u>Hospital/Healthcare</u>			
Community Hospital		120,000	
Skilled Nursing Facility		90,000	
Other Healthcare Treatment Facilities		150,000	
Medical Office		<u>60,000</u>	
Subtotal			420,000
<u>Support Commercial</u>			
Retail/Service		250,000	
Hotel		<u>200,000</u>	
Subtotal			<u>450,000</u>
TOTAL NON-RESIDENTIAL			2,900,000

HAMILTON FIELD MASTER PLAN EIR

FIGURE 2-3



- Street (right-of way width varies)
- Office/Research & Development
- Housing
- Open Space
- Military Inholdings

PROPOSED LAND USE DIAGRAM



SOURCE: BERG-REVOIR CORPORATION

TABLE 2-2
SUMMARY OF ACREAGE ALLOCATIONS BY TYPE OF USE¹

	<u>Acres</u>
<u>Business Use Areas</u>	
Central Business District	75.6
Hangar Row District (including miscellaneous parcels)	107.7
Major Roads	<u>41.9</u>
Subtotal	225.2
<u>Residential Use Areas</u>	
Reservoir and WAF Hills (including 12.8 acres of open space)	79.0
Historic District	28.4
Ammo Hill Residential (including 22.9 acres of recreational/open space and 23.9 acres of Wetlands open space)	97.8
Major Roads	<u>10.1</u>
Subtotal	215.3
<u>Additional Community Open Space</u>	<u>11.7</u>
Project Total	452.2 ²

¹See Figure 2-3, Proposed Land Use Diagram, for location of the major use areas within the project site.

²Actual total is 452.1 acres. Estimated acreage allotments could be adjusted during preparation of Precise Plans.

Residential

About 215 acres of the project area would be developed for residential use, including roads and approximately 60 acres of neighborhood open space. In addition, some residential units may be located on the upper stories of buildings located in the predominantly commercial areas.

Table 2-3 shows the summary of residential mix; 3,550 dwelling units are planned for the project, of which 2,600 would be regular rental units, 550 would be retirement congregate care rental units, and 400 would be for sale units. The regular rental units would be a mix of studios through three bedrooms, ranging in size from 450 to 1,000 square feet, with an average size of 800 square feet. The retirement rental units will be a mix of studios through two bedrooms, ranging from 450 to 750 square feet, with an average size of 600 square feet. The for sale units would be a mix of one through three bedroom units, ranging from 700 to 1,400 square feet in area, with an average size of 950 square feet.

Office/R&D/Warehousing

Offices are planned to include 690,000 square feet of space, including professional offices, sales and administrative offices, business service uses, services, and institutional uses. The FIRE (Finance, Insurance and Real Estate) category is expected to account for a substantial portion of the office space. The project sponsor's marketing efforts will attempt to locate a regional or home office for one or more major corporations. Multi-tenant facilities are planned to be available for smaller employers and incubator firms. This category also includes approximately 50,000 square feet for convenience banking and related financial services.

In the Research & Development category, the project sponsor is proposing as a major marketing focus the medical and health services sector. It is proposed that 440,000 square feet of medical research and development space be constructed, including studies for aging and biotechnology. An additional 300,000 square feet is proposed for research activities in other technological sectors, including electronics, alternate energy applications, and telecommunications.

TABLE 2-3
SUMMARY OF RESIDENTIAL MIX

	Size (sq. ft.)	Percent	Units
<u>Regular Rental Units</u>			
Studio	450 - 550	10	260
1 Bedroom	560 - 650	30	780
2 Bedroom	750 - 900	50	1,300
3 Bedroom	950 - 1000	10	260
BMR Units Included - 260		Subtotal	2,600
<u>Retirement Rental Units</u>			
Studio	450 - 550	10	55
1 Bedroom	560 - 650	45	250
2 Bedroom	700 - 800	45	245
BMR Units Included - 50		Subtotal	550
<u>For Sale Units</u>			
1 Bedroom	700 - 800	10	40
2 Bedroom	850 - 1100	80	320
3 Bedroom	1200 - 1400	10	40
BMR Units Included - 40		Subtotal	400
Total BMR Units - 350		Total Units	3,550

The project plans include 300,000 square feet of space for warehousing and 300,000 square feet of light industrial use in rehabilitated and new buildings. The rehabilitated hangars are proposed as especially suited to these uses. The project sponsor's marketing program would emphasize the availability of nearby manufacturing space for the project's research & development firms, especially in the medical/health sciences/biotechnology areas.

Hospital/Health Care

The project plans include a hospital and healthcare complex in response to health care interests in locating at Hamilton. A 420,000 square foot complex is proposed to include a general community hospital of approximately 120,000 square feet, a skilled nursing facility, other healthcare treatment facilities, and approximately 60,000 square feet of medical offices.

Support Commercial

The retail commercial component of the project is planned at 250,000 square feet. There would be two concentrated shopping areas. The larger shopping area, including a supermarket and a pharmacy, would be located near the Transit Center on the west side of the existing Northwestern Pacific Railroad right-of-way in the area of highest pedestrian concentration. The smaller shopping area would be located in the Old Headquarters Area. In addition, this component would include delicatessens, shops and business service outlets located throughout the commercial buildings. Commercial retail serving the residential population would be located in the predominantly residential areas, and include nighttime convenience marts and retail use on ground floors below residential buildings. There would be a range of restaurants, food services and other shops and service outlets in the project area to serve employees and residents at Hamilton Field.

The project is proposed to include a hotel with approximately 200 rooms and conference center facilities. The hotel would provide restaurants, business meeting facilities, and other support services for businesses at Hamilton.

Supporting Facilities

Day Care Facilities. In addition to day care facilities which may be established by businesses at Hamilton for their employees, the project is proposed to include commercial day care centers serving the market demand for child care by residents and employees at Hamilton. The project sponsor would actively promote the inclusion of day care centers within the facilities of large tenants and the attraction of commercial day care centers into the project.

Open Space and Recreation. The project would contain approximately 71 acres of open space (see Figure 2-3, Proposed Land Use Diagram). About 24 acres would be comprised of the proposed wildlife conservation and wetland areas around Ammo Hill and the proposed riparian zone along Pacheco Creek with restricted public access (see Section 3.2.3, Vegetation and Wildlife, for further elaboration). In addition to the 5.6-acre parcel planned for public sports fields on Hangar Avenue contiguous to the military ballfields and a 6-acre school/park site located on Main Gate Road, the project would contain about 36 acres of open space area for public use, including the tops of Reservoir and Ammo Hills.

Public use facilities would include tot lots, picnic areas, viewpoint areas, volleyball courts and trails. Paths for pedestrians and bicyclists would extend through the business and residential areas as well as the privately owned open spaces intended for common use. The trails are proposed to connect open spaces with plazas, courtyards, and lawn areas of the commercial and business portions of the project. A private recreational complex consisting of outdoor and indoor facilities (as yet undefined) is envisioned for the project, depending upon market demand.

The park parcels on Hangar Avenue and the top of Reservoir and Ammo Hills are planned to be dedicated to and managed by the City of Novato's Park and Recreation Department. The wildlife and wetland areas around Ammo Hill are planned to be dedicated to and managed by a public open space agency. Project common areas, including greenbelts and plazas for the use and recreation of project area residents and employees are planned to be owned and managed by the Hamilton Field Owners Association or building owners. The cost of maintenance would be raised through a combination of assessments levied on the project properties under a set of CC&Rs and from building operating expenses.

Transit Center. The project is proposed to include a transit center to be located adjacent to the Northwestern Pacific Railroad right-of-way between State Access Road and the new northerly Main Access Road. The transit center is proposed to be located within the most intensively developed commercial area on the site to maximize pedestrian access and availability to the center. Persons arriving at Hamilton Field via public transit would have the choice of walking to their destination from the transit center or riding an internal shuttle system (see Section 3.1.4, Traffic and Transportation, for additional details regarding internal circulation). The land for the transit center would be dedicated by the project sponsor to the transit authority, if such an authority would be formed.

Cultural. The project sponsor is considering the provision of a Hamilton Field museum to be operated by historical society organizations or as a separate entity. It is the project sponsor's intent that historic data relating to the development and use of Hamilton Field be housed and displayed at a location to be determined within the project. The space requirements for such a facility are yet to be determined.

2.4.2 PROJECT SCHEDULING AND PHASING

The project sponsor is preliminarily proposing that the development of Hamilton Field proceed in three identifiable phases over a period of about ten years. Development progress would depend on market demand. Figure 2-4, Preliminary Phasing Plan, illustrates the proposed phasing of project construction. The phased construction areas are planned to be submitted as one or multiple Precise Development Plans illustrating in greater detail building locations, circulation patterns, open space uses and other details of site development prior to preparing design and engineering construction drawings. During project construction, coordination with the military would be required to maintain emergency vehicle access to existing military housing and related facilities at Hamilton Field.

The following is a summary of the major components planned for each phase of construction. The acreage assigned to each component is an approximation, which may be adjusted at the Precise Plan stage of development. The phasing plan was developed by the project sponsor taking into account various requirements for construction, such as the availability of circulation improvements, utilities, grading and flood control, the removal of hazardous materials from previous military uses, the anticipated timing of obtaining various military parcels currently under negotiation, financing and marketing objectives, and maintaining a job/housing balance. During each phase of development, it is the project sponsor's intent to have sufficient housing units available for the employees of the new office buildings and other commercial and industrial establishments (see Figure 2-4, Phasing Plan). Construction phases are described as follows:

Phase One

- o Construct Office, R&D, Medical and Retail in the Central Business District and west of the public transit right-of-way on approximately 62.8 acres of land.
- o Construct Office, Light Industrial, R&D, Warehouse and Retail Uses in the Old Headquarters Area and Hangar Row District on approximately 36.2 acres of land.
- o Provide approximately 1,080 residential units on WAF and Reservoir Hills, including open space on Reservoir Hill, on approximately 65.3 acres of land.
- o Provide Retirement Housing west of Reservoir Hill, 550 units on 9.2 acres of land.

- o Construct major infrastructure: New Main Access Road, upgraded State Access Road and Nave Drive, Pacheco Creek realignment, water storage tanks and pipeline along Nave Drive.
- o Modify the Ignacio Interchange in the latter part of Phase One or early part of Phase Two.
- o Provide wetlands mitigation for wetland areas lost in Phase One. See **Section 3.2.3, Vegetation and Wildlife** for details relating to wetlands mitigation.

Phase Two

- o Construct Office, Light Industrial, R&D, Warehouse and Retail in the Hangar Row District on approximately 34.7 acres of land.
- o Construct Retail and Office in the Commissary Triangle area and at the entrance of Main Gate Road on approximately 14.8 acres of land.
- o Provide approximately 770 residential units in the Old Headquarters area on approximately 28.4 acres of land.
- o Provide sportsfields on Hangar Avenue. Construct Recreation/School site.
- o Provide private recreational facilities.
- o Construct major infrastructure: drainage improvements, new dike, upgraded Main Gate Road and Hangar Avenue, widen Nave Drive, and provide additional water storage.
- o Construct Alameda Del Prado Interchange modifications.

Phase Three

- o Construct Office and R&D along the northern portions of Hangar Row District on approximately 34.8 acres of land.
- o Provide approximately 1,150 residential units on Ammo Hill and north of new Main Entrance Road, including open space, on approximately 102.3 acres of land.
- o Provide remaining portions of wetlands mitigation area.

It should be noted that the phasing plan is generalized. Specific details relating to numbers of dwelling units, office buildings and other components of the project are not specified by construction year. In addition to the items of construction proposed by the project sponsor, there are additional site improvements mandated on jurisdictional grounds, such as flood protection improvements required by the U.S. Army Corps of

Engineers, habitat protection required by the California Department of Fish and Game, and improvements to utility systems required by the various agencies having jurisdiction over their respective utilities. Descriptive details of these improvements are contained in the respective technical portions of Section 3, Setting, Impacts and Mitigation Measures.

2.5 REQUIRED APPROVALS

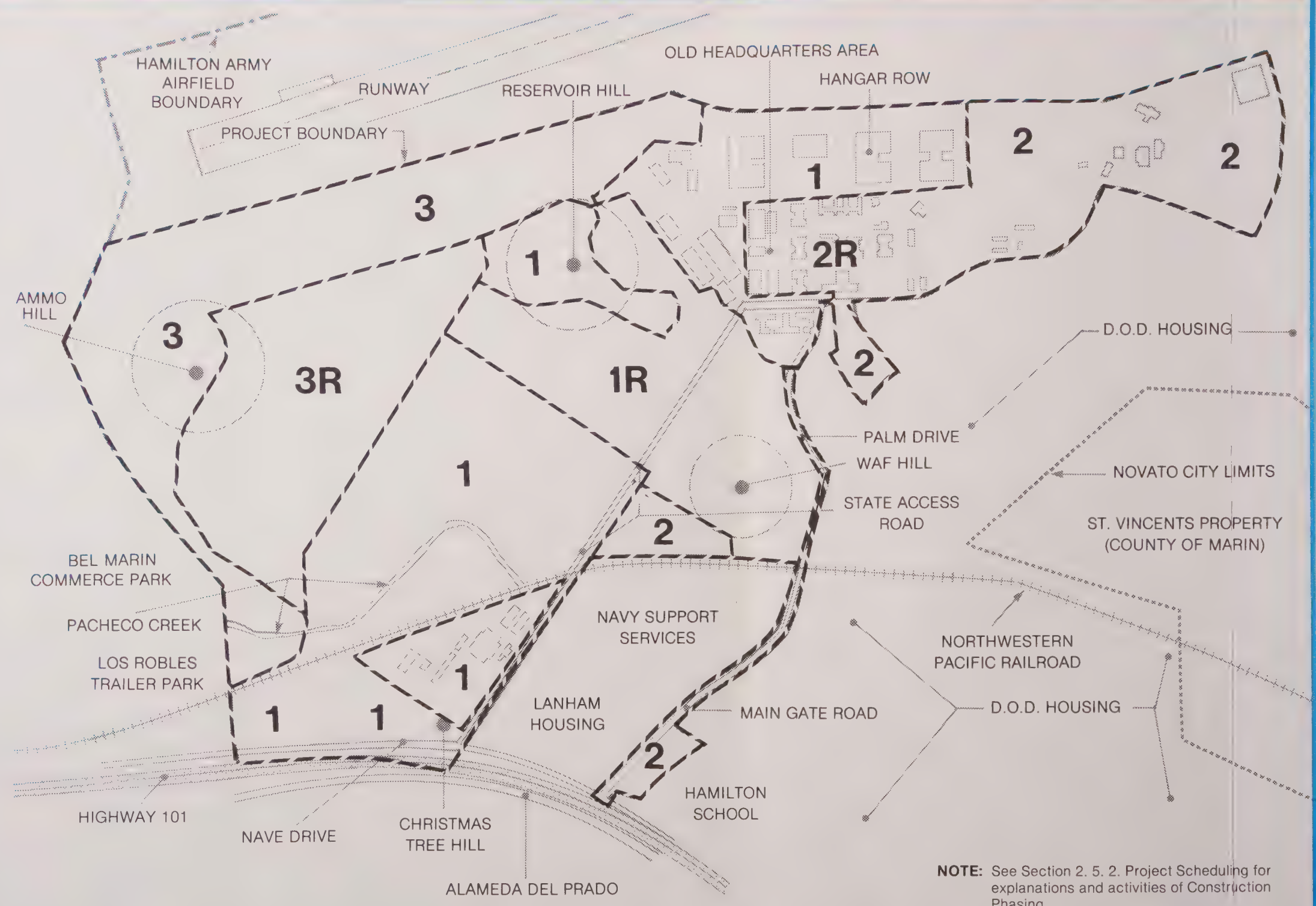
The project site is zoned Planned Community (P-C) District. The P-C designation permits latitude in physical design, land use arrangements, building heights, development densities and setbacks in order to maximize large scale planning opportunities, rather than strict conformance to the provisions of other zoning districts, and allows for a mix of land uses on the parcel, provided each type of land use conforms to the respective PC Zoning District requirements.¹

The project site is designated in the Novato General Plan as within the Ignacio-Hamilton Subcenter and is designated for Infill within the Subcenter on the Novato General Plan Map. The project would require a General Plan amendment and Master Plan approval from the City of Novato. Design Review and building permits would be required for construction. Amendments to the Novato General Plan would be required based on the interpretation and application of the General Plan policies, criteria and standards as applied to the project proposal (for elaboration see Section 3.1.1, Planning and Relationship to Plans).

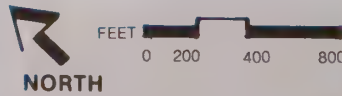
The project would require approvals from other agencies, including the Novato Fire Protection District, North Marin County Water District, the Novato Sanitary District and Marin Local Agency Formation Commission (LAFCO) for annexations to these special districts; the California Department of Transportation (CalTrans) for encroachment and construction permits within the Highway 101 right-of-way; the California Department of Fish and Game for a creek alteration permit; and the U.S. Army Corps of Engineers for permits related to floodplain protection and management and drainage improvements. The project site is not within the zone of ordinary jurisdiction of the San Francisco Bay Conservation and Development Commission (BCDC), which extends 100 feet landward from the shoreline of San Francisco Bay.

HAMILTON FIELD MASTER PLAN EIR

FIGURE 2-4



PRELIMINARY PHASING PLAN



SOURCE BERG-REVOIR CORPORATION

2.6 ALTERNATIVES TO THE PROPOSED PROJECT

As noted earlier in the Preface to the EIR, three alternatives are studied in parallel along with the Project as Proposed. The alternatives would range from a mix of 2,000 to 3,750 residential units and 1.7 to 3.1 million square feet of job generating land uses. This compares to the project as proposed which would include 3,550 residential units and 2.9 million square feet of job generating land uses. Table 2-4 provides a comparison between the project as proposed and the three alternatives. The vertical column entitled "Change" shows the amount of variance between the alternative and project as proposed.

The relative impacts and mitigation measures required attendant to implementing the proposed project or either of the three alternatives is addressed in each of the following EIR sections.

¹ As defined in the Novato Zoning Code, Chapter 19, page 1952-1953, the P-C District is established to:

- "1. Permit development proposals which, due to size and character, constitute a complete neighborhood;
- "2. Permit flexibility in physical design and land use arrangements;
- "3. Encourage developments which are sensitive to and respect the individual character of the property to be developed, including the surrounding community;
- "4. Permit a mix of land uses appropriately scaled and arranged such that the resulting development functions as a complete and identifiably independent community neighborhood."

This district may only be applied to property which, due to size, geographic configuration, and topographic character, can be construed as being capable of development as an integrated community neighborhood accommodating:

- "1. A residential population of at least 700 dwelling units.
- "2. Public service and facilities to serve the ultimate development density.
- "3. Convenience and service commercial to serve the ultimate development density.
- "4. Traffic systems sized to serve the overall development and aligned to recognize the integrity of the neighborhood unit."

TABLE 2-4
COMPARISON OF THE PROPOSED PROJECT AND THREE ALTERNATIVES¹

Type Use		M/P Application	Alt. #1	Change	Alt. #2	Change	Alt. #3	Change
Office	(sf)	690,000	890,000	+200,000	690,000	0	690,000	0
	(ac)			+10.0		+8		+10
R&D	(sf)	740,000	740,000	0	740,000	0	290,000	-450,000
	(ac)					0		-28.7
Medical	(sf)	420,000	420,000	0	370,000	-50,000	220,000	-200,000
	(ac)					2.9		-11.4
Hotel	(sf)	200,000	200,000	0	15,000	-50,000	50,000	-150,000
	(ac)					0		6.9
Retail	(sf)	250,000	250,000	0	100,000	-150,000	150,000	-100,000
	(ac)					5.7		0
Warehouse	(sf)	300,000	300,000	0	200,000	-100,000	150,000	150,000
	(ac)					5.7		8.6
L/I	(sf)	300,000	300,000	0	250,000	-50,000	150,000	-150,000
	(ac)					-5.7		8.6
Subtotal	(sf)	2,900,000	3,100,000	-200,000	2,500,000	-400,000	1,700,000	-1,200,000
	(ac)	185.7	195.7	+10.0	173.7	-12	131.5	-54.2
Housing								
For Sale	(units)	400	400	0	200	-200	400	-0
	(acres)	46.6	46.6	0	46.6	0	56.6	+10
Rental	(units)	2,600	2,300	-300	1,550	-1,050	2,800	+200
	(acres)	81.5	71.5	-10	93.5	+12	125.7	+44.2
Congregate Care	(units)	550	550	0	250	-300	550	0
	(acres)	9	9	0	9		9	
Residential Open Space	(acres)	59.7	59.7		59.7		59.7	
Subtotal	(units)	3,550	3,250	-300	2,000	-1,550	3,750	+200
	(acres)	196.8	186.8	-10.0	208.8	+12	251	+54.2
Other Acreages		69.6	69.6	69.6	69.6	0	69.6	0
Grand Total:	(sf)	2,900,000	3,100,000	+200,000	2,500,000	-400,000	1,700,000	-1,200,000
	(units)	3,550	3,250	-300	2,000	-1,550	3,750	+200
	(acres)	452.1	452.1	0	452.1	0	452.1	0

¹ Alternative 1: Decreased Housing, Increased Jobs; Alternative 2: Decreased Housing, Decreased Jobs; Alternative 3: Increased Housing, Decreased Jobs.

ENVIRONMENTAL SETTING,
IMPACTS AND MITIGATION MEASURES

3 ENVIRONMENTAL SETTING, IMPACTS AND MITIGATION MEASURES

3.1 SOCIAL/CULTURAL

3.1.1 PLANNING AND RELATIONSHIP TO PLANS¹

Various agencies have jurisdiction over the project site and surrounding land and water areas. First, the proposed project would relate to a number of planning goals and policies contained in the Novato General Plan concerned with the development of Novato and its planning area. These goals and policies function as a statement of intent for long-range development.² In addition to the goals and policies for the reuse of Hamilton Field as set forth in the General Plan, the City Council adopted, on December 11, 1984, the Land Use Plan for Reuse of Portions of Hamilton Air Force Base. Although not an adopted element of or an amendment to the Novato General Plan, the Land Use Plan established more specific criteria for development of the base than the City's General Plan, and is discussed further below in this section of the EIR.

Second, there are general policies in the Marin County-wide Plan that have relevance to the project.³ Although the proposed project is within the Novato City limits, and the Novato General Plan is the primary policy document for the project, the Marin Countywide Plan serves as a guide to long term physical development and use of resources throughout the County to the year 2000 and provides an area-wide general context in which to review the proposed project.

Third, there is also the San Francisco Bay Plan prepared by the Bay Conservation and Development Commission (BCDC).⁴ Although the project site is not within the zone of ordinary jurisdiction of BCDC, which extends 100 feet landward of the shoreline of San Francisco Bay, BCDC policies with respect to aviation use of Hamilton Field require explanation. The San Francisco Bay Regional Plan, prepared by the Association of Bay Area Governments, would also pertain to the proposed project in that the Regional Plan

identifies Hamilton Field as a regional resource for the development of mixed-use development and a regional employment center.⁵

It should also be noted that project development would relate to cumulative development and areawide growth inducements resulting from project development (see Section 4, Growth Inducements). The project could also influence growth in other jurisdictions as defined in Section 4 of this EIR and that growth in general would be guided by the provisions of community General Plan goals and policies established for other jurisdictions such as Sonoma County, Santa Rosa, Petaluma, Cotati, Rohnert Park, Sonoma and San Rafael within Marin County, not to the exclusion of other jurisdictions. This discussion focuses on the principal policy documents as they pertain to project development.

NOVATO GENERAL PLAN

The current Novato General Plan was adopted by the Novato City Council in September and November of 1981. The Goals and Criteria specific to the reuse of Hamilton Field were developed in 1979 jointly with Marin County and incorporated into the Novato General Plan in 1981.

The project sponsor, the Berg-Revoir Corporation, proposes a number of amendments to the Novato General Plan text and maps regarding reuse of Hamilton Field. (Amendments to other planning documents, including the Marin Countywide Plan, are not proposed.) This is because some details of the proposed project are not fully in compliance with the currently adopted General Plan. The amendments are proposed so that the General Plan as amended and proposed project would be compatible and in conformance with each other.

Some amendments would provide updated background information, which generally would not involve changes to, exceptions from, or clarifications of established goals and policies of the City of Novato. Other amendments would involve proposed changes to adopted City goals and policies, specifically for the reuse of Hamilton Field, while other amendments would involve potential exceptions from or clarifications of Citywide goals and policies as applied to Hamilton Field.

The following compares the proposed Master Plan project with the pertinent sections of the Novato General Plan. For each section, the relationship to the equivalent content of the 1984 Land Use Plan for Re-Use of Portions of Hamilton Air Force Base is noted. Proposed amendments by the project sponsor are also noted. Potential impacts related to changes in the General Plan are explained as appropriate.

The Urban Environment Element of the Novato General Plan contains a number of general goals and criteria specifically addressing the reuse of portions of Hamilton Field. As stated in the Urban Environment Element: **"Extensive study of the land and improvements in the excess property, and of local problems and needs, has led to a conceptual plan for an employment center with related housing and facilities. Hamilton would be more self-sufficient than other parts of Novato, but it should not be isolated."**

GOALS

"The City of Novato seeks to advance the following goals through the development of Hamilton. Proposals will be evaluated, first, in accordance with the goals, which are presented as an integrated whole and not listed in order of priority:

"1. To produce jobs for Novato and Marin County residents."

The 1984 adopted Land Use Plan for Reuse contains the equivalent goal: **"To produce jobs for local residents."** As proposed, the project would generate an estimated 7,300 jobs on the project site. This would not include jobs in design, engineering, construction, financing or materials fabrication and supply required for project construction, nor would it include jobs created throughout the Bay Area as a result of growth inducements (see Section 4, Growth Inducements). The project would therefore comply with Goal 1 of the General Plan and the equivalent Goal of the 1984 adopted Land Use Plan for Reuse.

"2. To develop Hamilton without net cost of services by the taxpayers of Novato, Marin County, and Special Districts."

As proposed, the project sponsors do not intend that the taxpayers support project development. A Redevelopment Survey Area for Hamilton Field was adopted by the Novato City Council in December of 1985. This was in response to the project sponsor's

request to form a Redevelopment Area because it was determined that the private sector acting alone would be financially unable to correct blighted conditions of the infrastructure at Hamilton Field to serve the project. The Redevelopment Agency has prepared a Proposed Redevelopment Plan for Hamilton Redevelopment Project Area No. 3 (see also Section 2.4, Project Characteristics and Scheduling, for additional information regarding the Redevelopment Plan).

The project sponsors have included in their proposed General Plan Amendments a qualification of Goal 2 as follows: "**... with allowance for the formation of a Redevelopment Area for Hamilton and the use of tax increment financing as a means of financing infrastructure improvements.**"

"3. To develop the property in accordance with environmental and transportation constraints with a mix of housing and transit services that will minimize the impacts of the journey to work."

As proposed, the project would employ an estimated 7,300 workers and provide a mix of 3,550 rental, rental/retirement and for-sale units. The number of rental units which would encourage workers to live on-site, and therefore minimize external traffic generation, would be up to 2,600 non-retirement units for this level of employment. The proposal for 3,000 non-retirement units at this level of employment is near the optimum mix of employment and housing in terms of reducing work trips on Highway 101. However, without mitigation, the existing capacity on Highway 101 in the project area would not accommodate buildout conditions for the project plus cumulative growth. The NWP railroad corridor could accommodate a portion of the volume generated by the project and cumulative growth, as a transit station is planned as an integral part of the project. The mode of travel on this corridor has not, as yet, been identified; however, initial estimates indicate that it could accommodate an estimated 7,000 peak-hour person-trips. This potentially available capacity would be needed primarily to the north of the site if it were to reduce vehicle trips from the site (additional information on public transit, commuting patterns, and Transportation Systems Management programs may be found in Section 3.1.4, Traffic and Transportation).

"4. To make use of innovative design features to conserve energy, harness alternative energy sources, reduce housing costs and provide needed services for residents and employees."

As proposed, the project would use building siting and landscaping to reduce energy consumption. Specifically, the project's buildings would be oriented to create solar access wherever possible by permitting maximum southern exposure on inside and outside spaces, thereby reducing space heating needs. Appropriate tree massing would include shading of paved surfaces and location of heavy foliage on the west side of buildings to reduce heat buildup and air cooling demand. Paint and other building finishes would be of light-colored, reflective materials and office buildings would have light wells and interior courtyards; both of these measures would reduce the need for artificial lighting.

Although the project sponsor is investigating the feasibility of solar water and space heating and a central heat cogeneration facility, no commitment has been made to utilize renewable energy resources (see Section 3.1.7, Energy, for additional information).

It is proposed that 3,150 rental/retirement congregate care rental units be constructed within the project. Services to be provided for project residents and employees would include day care centers, health care facilities, recreational facilities, cultural facilities and retail and commercial facilities (see Section 2.4, Project Characteristics and Scheduling for additional information). The project would therefore generally appear to conform with Goal 4.

CRITERIA

"The following criteria will be used in evaluating proposals for Hamilton. Proposals will be evaluated in accordance with their conformity to these criteria, which are presented as an integrated whole and not in order of priority.

"A. Land Use:

"Office/Commercial: A regional or home office for one or more major corporations would be most appropriate, to provide the economy of scale that would enable the developer to make necessary improvements, use innovative techniques, and offer amenities to residents

and employees. Preference will be given to an applicant who demonstrates that the jobs created will fit the skills of present Marin County residents, and who provides incentives for living on the site, rather than requiring substantial in-commuting."

As proposed, the project would provide 690,000 gross square feet of office and financial space and 250,000 gross square feet of retail and commercial space. The office space is intended for the use of corporations, including use as headquarters space depending on market demand. It is anticipated that the jobs created would be filled by approximately 3,430 professional service personnel, managers, technical staff, retail, clerical and administrative personnel. The 2,600 regular rental housing units would be provided with a first right of refusal given to those who would work at Hamilton, which is intended by the project sponsor to reduce in-commuting. The second right of refusal would be given to persons working 1.5 miles from Hamilton Field (this subject is discussed further in Section 3.1.3, Population, Employment and Housing). Analysis shows that slightly less than one-half (46%) of project site workers would be Marin County residents (see Section 3.1.3, Population, Employment and Housing). The project would therefore partially comply with Land Use Criteria "Office/Commercial."

The project sponsor's additional emphasis on medical facilities and on health and biomedical research would support job opportunities for Novato and Marin County residents with skills in these job sectors.

"Industrial: Light industrial and research-development uses are encouraged, including those that are related to alternate energy sources and technology. Use of existing structures for these is encouraged, as are labor-intensive and 'incubator' industries and communications industries which minimize the need to travel. Demonstration should be made that these activities will match the job skills of Marin residents, rather than requiring commuting."

As proposed, the project would provide 740,000 gross square feet of R&D space in new structures, while 300,000 gross square feet of space would be provided for warehousing purposes and 300,000 gross square feet of space would be provided for light industrial use in rehabilitated buildings. Labor intensive as well as equipment intensive industries would be encouraged to locate at Hamilton Field. R&D uses are anticipated to include medical,

health and biotechnology research and development companies, and communications research. It is anticipated that the jobs created would be filled by about 2,530 technical, managerial, professional services, medical research, production, and other workers who would contribute to transportation impacts associated with the project. The project would therefore generally comply with Land Use Criteria "Industrial."

"Residential: Housing, both rental and ownership, for a broad range of income levels is encouraged, with housing for low and moderate income families and individuals included in the mix. The types and sizes of units should be affordable by and appropriate for persons who work on the site, and should be related to Marin County's housing needs. The existing Lanham units should be rehabilitated for below market rate occupancy. Innovative design to conserve energy, provide shared facilities, and reduce maintenance and management costs should be included. The project should be phased in relation to other residential projects in the Novato area, so that the overall growth rate is consistent with the Novato General Plan. Exclusive residential use of the site, without related job activities, would add to the present pattern of out-commuting and is not appropriate."

As proposed, the project would provide both rental and ownership housing. Two thousand six-hundred units would be market rate rental units and an additional 550 rental units would be for senior citizen housing. Four-hundred units would be for-sale units. The housing units would generally be affordable to households with income of at least \$22,000 per year, assuming households would spend no more than the Federal standard of 30% of their gross monthly income on rent (see Section 3.1.3, Population, Employment and Housing). While project workers in the lower income categories could afford to rent the apartments, it is unlikely that workers with a household income greater than \$60,000 per year would choose to live in the rental housing on-site given the relatively small size and high density of the units. The project sponsor has proposed to participate in the City of Novato's voluntary incentive program to provide below-market rate housing.

It should be noted that the 1984 Land Use Plan for Reuse listed as a favored use: **"Residential - a spectrum of medium- and high-density housing, including low- and moderate-cost housing" (Page 5).**

The Master Plan proposes that 350 units, or about 10% of the units, be BMR units, priced for moderate income households, and that the rest be priced at market rates. Inclusion of the project within a redevelopment area may involve the allocation of Housing Set-Aside Funds for low-income housing needs within the project area, including subsidation of housing costs for low-income household workers working at Hamilton. The project sponsor's proposed General Plan Amendments do not propose any deletion of the low-cost housing policy language from the current General Plan, but a proposed addition of language based on the 1984 Land Use Plan for Reuse deletes a reference to low- and moderate-cost housing.

In the light of the City's recent reaffirmation, in adopting amendments to the Housing Element in April, 1988, of its commitment to the provision of affordable housing opportunities in Novato, including opportunities for low-income households, the City should determine whether the project as proposed is in conformance with the General Plan policies regarding the provision of affordable housing for low-income families and individuals.

It should be noted that the proposed General Plan amendments do not provide for an updating of the status of the existing Lanham housing units, which have already been rehabilitated for below market rate occupancy. Energy conservation is intended to be implemented by the project sponsors (see Section 3.1.7, Energy). Shared facilities would include common open spaces, day care centers, recreation facilities, health facilities, retail and commercial space (see Section 2.4, Project Characteristics and Scheduling). Residential areas would be operated under the provisions of a declaration of Conditions, Covenants and Restrictions (CC & Rs) for building and grounds management and maintenance. The total project is proposed to be constructed in three phases over about a ten year time period, depending on market demand. The market demand for rental housing in the greater Novato area would dictate the rate at which project housing would be constructed in relation to other housing projects in Novato. Exclusive residential use of the site is not proposed (see Section 7.2, Other Alternatives Studied).

"Retail/Commercial: Retail stores and commercial services should be at a scale to serve southern Novato area residents, including Hamilton employees and Navy housing residents.

Retail and commercial uses should not compete with existing or approved regional facilities to be developed in the North Marin area."

As proposed, the project would provide 250,000 gross square feet of retail and commercial space. The proposed hotel would provide restaurants, business meeting facilities and other support services for businesses at Hamilton. Commercial uses would include retail stores, personal services, restaurants and perhaps a service station. Some retail services may be included in office buildings. The specific commercial uses can only be recommended at this time, subject to change based on eventual need and market demand, but would be intended to serve primarily project residents and workers, Navy housing residents, Lanham housing residents and other nearby residents rather than rely on the regional market for financial support. Commercial retail serving the residential population would be located in the predominantly residential areas and include nighttime convenience marts and retail space. The project would generally comply with Land Use Criteria "Retail/Commercial."

"Transportation: Recognizing that transit and traffic problems are among Marin's most pressing issues, all options should be preserved for water and land transportation. The railroad right-of-way must remain open and intact, although its future disposition is beyond the responsibility of the applicant. This land use plan shall preclude civilian aviation use by any governmental agencies. There is no aviation use proposed in the Hamilton plan."

As proposed, the project would not provide water oriented transportation, nor would the project preclude future opportunities for water oriented transportation. The Bay is shallow in the area of Hamilton Field and dredging would most likely be required to accommodate a port for waterborne transportation. In response to previous inquiries, it cannot be determined at this time if the construction of a port for waterborne transportation would interfere with aviation use of Hamilton Field. This would relate to the location, size and frequency of use of a port facility. The project would not develop the existing Northwestern Pacific Railroad right-of-way for public transit, but would hold open the option for providing a transit station adjacent to the right-of-way, should public rail or bus transit become a reality in the future that uses the existing right-of-way. With respect to civilian aviation use at Hamilton Field, the proposed Master Plan does not

specifically encourage or aid potential civilian aviation use of the existing runways.⁶ Access to the runways would not be prevented. Correspondingly, continued military use of the runways requires that safety and noise setbacks be provided for military aviation use (see Section 3.1.2, Land Use and Section 3.2.5, Noise). It should be noted that the proposed Master Plan does not encompass the runways. The project would therefore generally comply with Land Use Criteria "Transportation."

"Recreation: Public and private recreation facilities are to be encouraged."

As proposed, and depending on market demand, the project would provide a private recreation complex including indoor and outdoor recreation facilities. Community-wide memberships would be available, although priority would be given to people working and living at Hamilton Field. Additionally, 5.6 acres of sports fields are planned to be located at the south end of Hangar Road adjacent to existing military sports fields. A tot lot, picnic area and volleyball center is planned to be located on the south side of Ammo Hill within the designated open space area. A picnic area, turf areas and a tot lot are also proposed for Reservoir Hill. The project would contain about 36 acres of open space for public use on Ammo, WAF and Reservoir Hills. The project would therefore comply with Land Use Criteria "Recreation."

"Education: Schools for local residents should be provided, if necessary to supplement the two schools which the Novato School District already operates on or adjacent to the Hamilton site. Other educational and public information activities related to on-site research and development in energy and technology are appropriate. Major institutional and conference uses would be considered."

The project would generate the need for an additional 22 elementary school classrooms under school enrollment projections. Developer fees would be assessed by the City for providing educational facilities (see Section 3.1.11, Costs/Revenues). No specific other educational and public information activities related to R&D technologies have been proposed at this time, although it would be anticipated that such activities could occur, given the ultimate R&D mix and types of corporations that would locate at Hamilton Field. The project would therefore generally comply with Land Use Criteria "Education."

"Hotel: A hotel-conference center would be appropriate."

A conference center is proposed to be included with construction of a 200-room hotel.

"Open Space/Wetland Restoration/Flood Control: These are highly appropriate uses to be undertaken by public agencies in the lowland areas. However, if flooding of additional portions of these areas is required, it will be necessary to protect existing buildings and surrounding private lands from damage. It will also be necessary to allow the existing sewage treatment plant (existing military treatment plant) to continue in operation until it is replaced, and to schedule flooding during times of the year when water quality will not be impaired."

Public open space as defined previously in this section and wetlands are proposed for dedication to public agencies (see Section 3.2.3, Vegetation and Wildlife). Flood protection would be required by the project sponsor (see Section 3.2.2, Hydrology and Water Quality). The project would therefore partially comply with Land Use Criteria "Open Space/Wetland Restoration/Flood Control." It should be noted that the existing military sewage treatment plant is no longer in operation.

"Agriculture/Mariculture: Use of lowlands within the existing diked area for grazing and forage production, and possibly for production of other crops, is appropriate, provided that water quality concerns are met."

The project site does not include lowlands within the existing diked area (around the runways) and it therefore would not be the project sponsor's responsibility to consider agriculture and/or mariculture uses within the diked area. Agriculture or mariculture uses do not occur on the project site. However, some of the R&D uses may conduct laboratory research helpful to the agricultural or maricultural sectors of the economy.

"B. General Development Standards:

"Energy Conservation: Orientation of buildings, use of materials, and landscaping should maximize net solar gain, by using the sun for maximum heating in winter and cooling in summer. For example, buildings should have a north-south rather than east-west orientation with the largest window areas on south-facing walls. Trees should be located to provide windbreaks without interfering with the placement of rooftop solar panels."

As proposed, the project would comply with these requirements. Landscaping, building orientation and building materials would be considered in light of their energy-conserving aspects (see Section 3.1.7, Energy).

"Alternate Energy Sources: The direct inclusion of experimentation and application of new energy sources to reduce dependence on fossil fuels, including solar, wind, and biomass, is encouraged. At a minimum, the project should leave options open for later inclusion of new technology that is not yet ready for application."

As proposed, project plans do not now include use of alternative energy sources, although the possibility of a future transition to renewable energy use is not foreclosed. The project would therefore not fully comply with Development Standard "Alternative Energy Sources."

The 1984 Land Use Plan for Reuse proposes substitute wording for the equivalent goal: **"To provide for all available technologies, such as energy conservation, communications linkages, etc. in order to make any development competitive in the current and foreseeable market."** This goal statement de-emphasizes the primacy of alternate energy experiments. The project sponsor proposes General Plan amendments which delete the specific references to experimentation for alternate energy sources, while retaining the requirement to incorporate energy conservation features into the project. An earlier proposal for Hamilton reuse called Marin Solar Village envisioned a major emphasis on innovative planning and experimentation for alternate energy sources, but the project as currently proposed would not be achievable with such a major emphasis. Deletion of such goals and policies from the General Plan would not of itself have impacts, but the degree of possible mitigation of project impacts related to consuming non-renewable energy sources would be affected. (see Section 3.1.7, Energy).

"Environmentally Sensitive Areas: No new development is recommended on the lowland areas, outward of the historic shoreline, beyond reuse of existing structures. Design of the project should allow for possible future flooding of lowland areas by providing protective dikes around buildings and land to be preserved. Hills in the upland and open space areas are not to be graded excessively or 'daylighted', although some regrading may be desirable to restore a natural appearance. Buildings on hills and ridges should conform

to the natural slope to the greatest extent possible, and should be clustered for a minimum visual impact."

As proposed, there are about two acres of land within the housing area south of Ammo Hill that extend into the historic Bay edge. The existing hangars, portions of the Old Headquarters Area and lands south of the Old Headquarters Area occur outward of the historic Bay edge; any proposed buildings in this area would be located outward of the historic Bay edge.

The project would require the protection of proposed buildings and property improvements in lowland areas from flooding (see Section 3.2.2, Hydrology and Water Quality). It is recommended that hills in the uplands and open space areas not be excessively graded, that a natural hillside appearance be preserved, and that buildings on hills conform to the natural slopes and be clustered (see Section 3.1.9, Visual Quality). However, the east side of Reservoir Hill would require grading to correct previous excavations (and develop building sites). The project would therefore partially comply with Development Standard "Environmentally Sensitive Areas."

"Historic Buildings and Areas: The character and continuity of the Main Entrance Road and Administrative Area should be retained, through use of compatible landscaping and building materials in any new development. This corridor should be viewed as serving primarily the residential and community center areas, not as the main entrance to the new development part of the project."

As proposed, the project would preserve the architectural integrity and landscape components of the Old Headquarters Area. Main Gate Road, though to be improved with new pavement and landscaping, would be retained in its current location providing direct access to the Old Headquarters Area, hangar area and proposed housing area (see Figure 2-3, Section 2.4, Project Characteristics and Scheduling). The project would generally comply with Development Standard "Historic Buildings and Areas.

The 1984 Land Use Plan for Reuse does not have a specific policy for Main Gate Road but does state as an assumption that the North Entrance Road and the grid system streets in the Administration District will be retained, but all other roadway locations may be flexible (Page 3).

The proposed Master Plan includes the proposed widening of Main Gate Road to four lanes between the N.W.P. right-of-way and the Old Headquarters area. This would represent a change in emphasis from the originally proposed Master Plan in which Main Gate Road was assigned proportionally fewer trips. The project sponsor has proposed amendments to the General Plan to clarify that Main Gate Road may provide access to the southern portion of the reuse area and should be upgraded as required by traffic needs. This could be a potentially significant issue, since a widening to four lanes along Lanham Village, with traffic on this road at the levels projected for project build-out, could have impacts in terms of traffic noise and safety.

"Public and Private Services: The Hamilton community should be designed to contain as complete as possible a range of public and private services for on-site residents and employees. This is to advance the goal of self-sufficiency and to reduce the need to travel to and from the site."

As proposed, the project would provide public and private services for project residents and employees, assisting in project self-sufficiency. The services would include retail and commercial space, health care facilities, day care facilities, and recreational facilities (see Section 2.4, Project Characteristics and Scheduling). The project would therefore comply with Development Standard "Public and Private Services."

"Infrastructure Improvements: It will be necessary for the developer to bear the financial burden of water and sewer main installation and expansion of sewage treatment facilities. In planning for wastewater disposal, options should be left open for the future application of innovative methods, such as the use of natural filtration through the marsh. Some potentially usable, alternative systems have not yet received all necessary approvals from water quality and public health agencies, and may not be available in time for development of the project. However, the opportunity to apply such methods in the future should be left open and experimentation is encouraged."

As proposed, the project would essentially involve reconstruction of the water, sewage, and storm drainage systems to meet current performance standards. The project would include the formation of a Redevelopment Project Area, (see Item 2 under Goals, above, for additional discussion).

"C. Access and Circulation:

"New Access points should be provided to the northwest portion of the site, where major new development will occur. Two possible new routes are from the north and west, a road extending north to Bel Marin Keys Boulevard, which will connect with the improved Ignacio interchange, and a new road extending from Alameda del Prado to the east across the freeway. These two routes could be linked for efficient ingress and egress, and to serve a bus transfer park-and-ride facility. The present Main Entrance Road, which should be retained in its present character to the greatest extent possible, should serve as access to the existing residential-community center areas and to the Administrative and Hangar areas."

As proposed, the project would provide an access road to the north of State Access Road, as provided in the General Plan guidelines. State Access Road would also serve as a major road into the site. The project is in keeping with the General Plan guidelines in that Main Gate Road would be maintained as is, improved with new pavement and landscaping, and would serve a portion of the residential development and the existing hangar area (see Figure 2-4, Section 2.5, Project Characteristics and Scheduling). The proposed plan would diverge from the General Plan guidelines in terms of the new off-site roadways which are called for. The proposed plan would not provide an additional overcrossing over Highway 1001, and it would not include a connection to Bel Marin Keys Boulevard.

The 1984 Land Use Plan for Reuse does not specifically provide for freeway interchanges, but does include Nave Drive as a major road serving the reuse area. The proposed Master Plan will not require a new interchange on Highway 101 or a new road to the west across U.S. 101. Improvements to the Ignacio interchange are proposed as well as modifications to the existing freeway on-ramps and off-ramps. The project sponsor has proposed amendments to the General Plan which delete the new freeway overcrossing and provide for the interchange and ramp improvements proposed in the Master Plan. These proposed

changes to the General Plan amount to proposed alternate mitigation measures, and their construction would mean fewer construction impacts than would the construction of the roadway improvements currently envisioned by the General Plan. In addition, the current proposed alternative mitigation measures are updated proposals consistent with the Project Study Report in preparation by CalTrans and the City of Novato.

"The south entrance should continue to serve the Navy housing as well as the surplus recreation/open space areas. An internal road connection between the New Development area and the Administration and Hangar/Warehouse areas should be provided. The extent of necessary improvements and the number of lanes required for various roads should be determined in conjunction with the review of proposed land uses. Depending on the level of available financial support from CalTrans, it is likely that the developer will have to bear much of the financial burden of needed transportation improvements. The use of internal transportation methods other than autos, such as mini-buses and bicycle paths is strongly encouraged. Reduction of the dependence on the automobile is a major intent of the Hamilton project."

As proposed, the south entrance (Main Gate Road) would continue to serve the Navy housing and open space areas south of Main Gate Road. The proposed project street system would connect new development with the Administration and Hangar/Warehouse areas.

Although the Master Plan for development of Hamilton Field is general at this time, the project sponsor envisions the use of bicycle trails and pedestrian trails throughout the project site as plans for specific areas are developed. These trails would be combined in such a way as to provide the option for bicycle and pedestrian movement throughout the project site in lieu of using the automobile.

The 1984 Land Use Plan for Reuse contains as circulation policies possible access connections from the northeast through Bel Main Keys and from the southeast through St. Vincents. The access from St. Vincents is described as "desirable," and the access from the northeast as depicted on the Land Use Circulation Map is described **"tentative, and after further study a different alignment may be adopted"** (Page 6).

The Master Plan provides that the project will reserve the right-of-way for a connection to a possible future Eastside Arterial, commonly referred to as McInnis Parkway, expected to run generally parallel to Highway 101 and to extend southward from Route 37 to San Rafael. Connections to such a roadway would provide access to the project site from the southeast through the St. Vincents area.

The project sponsor has proposed a General Plan Amendment which would delete the specific reference to a possible new road extending north to Bel Main Keys Boulevard and would add a policy that provisions should be made for future connections to a possible Eastside Arterial (McInnis Parkway) which could connect to Bel Marin Keys and areas to the north. The possibility of providing connections to a possible Eastside Arterial, while a potential mitigating measure for traffic impacts of the proposed project on Highway 101, would have impacts of its own, such as traffic, noise, and air pollution, which will need to be adequately studied and mitigated.

Intensity Standards

The Novato General Plan does not have specific policies for the level of intensity of development at the project site, and density standards for the project area are not stated on the currently adopted Land Use Map, since the project site was exempt as military lands when the density standards for various properties in the City were determined. The General Plan Background Information section for the Land Use Element states an assumption that eventually the reuse area will be developed with up to 1,000 housing units, up to 10,000 jobs, and an appropriate mix of public and private facilities to serve the Hamilton area (Page LU-19). The Land Use Element is also based on an assumption that while the City of Novato generally has a limited supply of land, the Hamilton reuse area is the major exception to the general situation and **"Several hundred acres at Hamilton will become available for fairly intensive urban development"** (Page LU-21). The 1984 Land Use Plan for Reuse states the assumption that utility capacity and circulation and access improvements can be provided for up to 1,000 dwelling units and 10,000 employees, or an equivalent demand (Page 4).

The 1984 Land Use Plan for Reuse notes that exceptions to currently adopted density standards **"may be allowed where other public benefits would result"** (Page 7).

The project sponsor has proposed General Plan Amendments to change the assumed holding capacity of the site in terms of the utilities and circulation/access improvements which can be provided from 1,000 dwelling units and 10,000 employees to 3,550 dwelling units and 8,000 employees, or an equivalent demand. Other proposed amendments stated specific densities of up to 12 residential units per acre on the hillside slopes, up to 40 residential units per acre on the flat areas designated for residential development, and up to 60 units per acre for retirement congregate-care housing, and floor/area ratio standards for the non-residential development. The project sponsor also proposed to include in the General Plan acreage allocations to types of use.

As addressed in Section 3.1.9, Visual Quality, the proposed project would result in more intense development than elsewhere in Novato. The City should consider whether or not to include in the General Plan Policies for Hamilton Reuse which are tied to specific numbers proposed by the project sponsor: i.e., maximum numbers of units and jobs, units per acre, and acres allocated to primarily residential, commercial, and open space uses. General policies are usually more appropriate for a General Plan. The Planned Community (P-C) Zoning District and the Master Plan process may provide adequate mechanisms for flexibility in development and for exceptions to general City-wide intensity standards as appropriate for the development potential presented by the Hamilton site. (For additional information refer to Footnote #1 in Section 2.5, Required Approvals, regarding the provisions of the PC District.) The General Plan appears to provide the policy framework for exceptions in the case of Hamilton (as opposed to the rest of the City) in the direction of fairly intensive urban development.

The 1984 Land Use Plan for Reuse proposed that building heights should be limited to three stories, with allowance for exceptions in conformance with Land Use Policy No. 5 (Page 9). The Master Plan proposes commercial buildings up to six stories in height, residential buildings up to three stories over parking, and retirement units in lower flat areas up to 60 feet in height or six stories over parking. The project sponsor has proposed a General Plan Amendment which would incorporate the alternate building height limits for Hamilton proposed by the project sponsor as approved exceptions to Land Use Policy No. 5.

The visual impacts of taller buildings are addressed in Section 3.1.9, Visual Quality. One important implication of the proposed taller buildings at Hamilton and related General Plan amendments is the question of whether a precedent would be set for future development in the City by sponsors who might request exceptions to downtown building heights. Another important implication is the question of how taller buildings at Hamilton would affect Novato's current General Plan policy that the City's overall visual image should be characterized by lower structures and less intense development. The project sponsor has partially addressed these questions by proposing language allowing height and intensity standards which are specific to the Ignacio/Hamilton sub-center. However, the City appears to have acknowledged in the General Plan that Hamilton is an exception to the general rule of low intensity development in Novato and that Hamilton is available **"for fairly intensive urban development"** (Page LU-21).

As noted previously (see Section 2.5, Required Approvals), the project site is zoned Planned Community (P-C) District which permits latitude in physical design, land use arrangements, building heights, floor area ratios and setbacks rather than strict conformance to the provisions of other zoning districts. Further, more detailed planning review would be required after any Master Plan approval.

Affordable Housing: The Novato General Plan contains the policy that the City of Novato will explore a joint venture with San Rafael and Marin County with the possibility of providing a housing demonstration project at Hamilton Air Force Base or the St. Vincent's property (Urban Environment Element, Housing Objectives and Policies, Policies on Density and Affordable Housing, Page UE34). This policy was not included in the 1984 Land Use Plan for Reuse nor included in the April, 1988 amendment of the Housing Element. The project sponsor has recommended deletion of Hamilton as a site for such a joint venture. The governmental joint venture concept for an affordable housing demonstration project had its roots in an era when the local governments were considering taking title to the parcels at Hamilton which would be declared surplus by the federal government. Since the proposal no longer seems current or realistically viable, the City may want to consider deleting from the General Plan the entire policy as well as the identification of Hamilton Field as a possible site. Amendment of this policy would not reduce the amount of affordable housing provided in the project, since the Master Plan includes a proposal of 350 BMR units.

Hamilton as HOP Site. Similarly, the Novato General Plan contains the policy that property which is released as surplus by any public agency and which has a residential land use classification should be evaluated as a possible Housing Opportunity Program (HOP) site. The 1984 Land Use Plan for Reuse did not propose that Hamilton be used as a HOP site. The April, 1988 amendment of the Housing Element did not specify Hamilton as a HOP site. The Master Plan does not provide for a HOP site at Hamilton, and the project sponsor has proposed amendments to the General Plan to state that Hamilton Field is not an appropriate location for a HOP site. The City may consider retaining the Citywide policy regarding HOP sites and determine that affordable housing can be provided at Hamilton as proposed by providing 350 BMR units and those subsidized by redevelopment tax increment revenue without using the HOP program.

MARIN COUNTYWIDE PLAN

The Marin County-wide Plan has been developed to establish an overall framework and set of goals to guide County-wide development to the year 2000. While the City of Novato has control over development decisions within its jurisdiction as defined by the City Limits, the County provides development decisions in unincorporated areas. In the County-wide Plan, the "Novato Planning Area" includes both the City of Novato and unincorporated areas around the City. For the Novato Planning Area, the County-wide Plan states: "Future employment in Novato is expected at Hamilton Air Force Base. Both Novato and the County have adopted mixed use criteria for Hamilton (not including aviation) that could mean as many as 10,000 new jobs in southern Novato. Workers employed in the northern County could commute from southern Sonoma, and take advantage of the lower cost housing in that area."

The proposed project would provide work opportunities for an estimated 7,300 employees as discussed previously. As a mixed use proposal, the project would provide housing, and employment respecting office use, R&D use, medical facilities, warehousing, light industry and other employment categories (see Section 2.4, Project Characteristics and Scheduling). However, workers employed in north Marin that commute from Sonoma County aggravate the existing morning southbound and evening northbound commute, which is currently a problem in north Marin County. It is the project sponsor's intent to minimize adverse impacts on freeway commuting through the provision of rental housing with the first right of refusal to be given to those who would work at Hamilton Field

(traffic impacts are discussed in Section 3.1.4, Traffic and Transportation). See also Section 3.1.3, Employment, Housing and Population for a discussion of the housing right of refusal program.

There are a number of policies in the County-wide Plan concerning density and the location of future development, some of which are relevant to the Hamilton Master Plan project as discussed below:

Policy B-1: "First priority should be given to infilling developed areas and second priority to development on the fringes of Developed areas. Development in areas where public facilities are not available or where they would require costly expansion should be discouraged until such time as comprehensive plans for efficient expansion of public facilities can be implemented."

The proposed project would constitute reuse of a developed area. While the project would be on the southeast edge of Novato, it is within the City limits and has been intensively used for military purposes in the past. While utilities are in place, many are old, inefficient and would require replacement and improvements to serve the proposed project. The expansion of public utilities to serve the project would be implemented as detailed site development plans for the various project phases are prepared.

Policy B-2: "The County seeks to create balanced communities which house and employ all income groups and which provide a full range of facilities and services. Residents should have the opportunity to live and work in the same community, and to fulfill shopping, business, recreational and educational needs within a reasonable distance of their homes."

The proposed project would provide opportunities for housing and employment with support facilities as discussed above under the Novato General Plan. A major portion of project housing would be provided in the area to be developed near the center of the project site, with access available to employment and services around the periphery of the housing area (see Figure 2-3, Land Use Diagram).

Policy B-3: "The location and density of all development should be mutually coordinated with the transportation network and transit systems in order to foster energy conservation and to minimize the circulation impacts of new development."

The proposed project would provide the phasing of roadway improvements to correspond with construction of project components (see Section 2.4, Project Characteristics and Scheduling, Item 2.4.2, Project Scheduling and Phasing). However, the project as proposed would add traffic to Highway 101 in the peak travel directions which are currently characterized by poor operating conditions.

To reduce potential traffic impacts on Highway 101, the project's plans provide for a Transit Center to be located adjacent to the Northwestern Pacific Railroad right-of-way between State Access Road and the New Main Access Road. The Transit Center would be centrally located within the most intensively developed commercial area, southwest of the hotel and conference center. It is the intent of the project sponsor that persons arriving at the project site on public transit, should the railroad right-of-way be developed for transit use by an authority yet to be organized, would be able to transfer to an internal shuttle system or access convenient pedestrian walkways to reach their destinations. The land for the Transit Center would be dedicated by the project sponsor to the transit authority and money for its construction would be made available from funds generated by transit fees assessed on area development (see Section 3.1.4, Traffic and Transportation for additional information).

Policy B-4: "On all large developments, dwelling units should be sited to allow transit service to be delivered more efficiently. Dwelling units should also be sited in a manner that reduces trip length to neighborhood facilities and, thereby, allows more trips by bicycle or foot."

The proposed project would provide a major portion of the housing near the center of the site, as discussed above. The project sponsor intends to provide bicycle and pedestrian ways for travel throughout the site. A portion of the housing in the center of the site would abut the Northwestern Pacific Railroad right-of-way, which is currently being considered for future public transit use. Commercial areas for resident use would be located within the housing areas.

Policy B-5: "Commercial and higher-density residential development should be in areas where there is high transit accessibility and service capacity, rather than allowing sprawl or continuous strip development along freeway corridors."

Refer to the discussion under Policies B-3 and B-4 above. Much of the more recent commercial development in Marin County has occurred along the U.S. 101 corridor. The proposed project would represent a continuation of development along the freeway corridor. The project would be located where there currently is not high transit accessibility and service capacity, although the Northwestern Pacific Railroad right-of-way is being investigated for transit use. Should the Northwestern Pacific Railroad right-of-way, which runs through the project site, be utilized in the future as a public transit corridor through Marin County, the project would partially be in conformance with Policy B-5 of the Marin Countywide Plan. A transit center (station) is proposed for development on the project site coinciding with potential development of the railroad right-of-way as a mass transit facility.

Policy B-6: "Housing should be integrated into commercial and industrial areas where appropriate."

An unspecified portion of the housing would be mixed within buildings slated for commercial use. Other portions of the project housing would be constructed within structures to be devoted solely to residential use, but within proximity to commercial development.

Policy B-7: "Development should be discouraged in those areas which have high natural resource values or which pose significant hazards to life or property. Where development is permitted in such areas, the permitted density should be low, and structures should be sited in order to minimize adverse impacts."

Portions of the north project site area would be set aside for wetlands preservation and enhancement (see Section 3.2.3, Vegetation and Wildlife) to compensate for the partial loss of existing wetlands. Development within the lower site elevations would require flood protection to protect life and property as discussed in Section 3.2.2, Hydrology and Water Quality.

SAN FRANCISCO BAY PLAN

The Bay Conservation and Development Commission (BCDC) is the state agency charged with planning, regulating and managing the San Francisco Bay segment of the California coastal zone, consisting of San Francisco Bay and its shoreline. BCDC's area of jurisdiction includes San Pablo Bay with the Hamilton Field shoreline, and extends inland a distance of 100 feet from the line of highest tidal action of the Bay. The agency's mandate under the Federal Coastal Zone Management Act of 1972 (P.L. 92-583), as amended is to protect the coast as a natural resource, and manage its use so as to best meet the needs of the public. BCDC objectives include increased public access to the Bay, and the restriction of unnecessary development or development that would have adverse impacts on the Bay.

In the San Francisco Bay Plan, BCDC designates Hamilton Field as an Airport Priority Use Area, restricted to airport uses and airport-oriented industries if such industries cannot be located elsewhere.

As discussed previously, the proposed project would not necessarily preclude or aid potential civilian aviation use of the existing runways. The project would not include the construction of tall structures (buildings or transmission line tower structures) in the runway approach or takeoff areas. Continued military use of the runways requires that safety and noise setbacks be provided for military aviation use (see Section 3.2.5, Noise). Use of the existing roadways would not obstruct runway access. While four of the five major hangars at Hamilton Field are within the project boundaries, the runways are not within the project boundaries. Use of the hangars for warehousing, R&D use or related functions would not necessarily preclude use of the hangars for other functions in the future, depending on market need and economic viability associated with such uses. Because the runways are not within the project boundaries, it is doubtful the project would add to any costs associated with converting the airfield to general aviation use. However, it should be noted that military use of the runways and associated aircraft facilities would be expected to occur for an indefinite period of time (for supporting data relating to commercial aviation use of Hamilton Field, refer to Appendix A, History of Hamilton Field). It would be up to City of Novato officials to pursue whatever actions they feel are necessary regarding civilian aviation use of Hamilton Field.

It should be noted that the proposed project would not include work within the Commission's jurisdiction. Thus no Commission permit for the project as proposed would be required.

SAN FRANCISCO BAY REGIONAL PLAN

The Association of Bay Area Governments, Regional Plan for the San Francisco Bay Area, contains a number of general policies and goals relating to planning and growth within the greater Bay Area. Additionally, there are a number of issues discussed in the Regional Plan by sub-areas, including the Urbanized Marin County Planning Area. The Plan's Urbanized Marin County issues of relevance to the proposed project are discussed below.

"Local projections indicate that both basic and population serving employment may increase by two-thirds over the next twenty years in the County. Much of this growth, however, depends on plans to develop Hamilton AFB as a major employment center and local policies to encourage office and commercial growth. The County lacks several factors which tend to foster basic industrial growth: the availability of inexpensive land and labor, deepwater harbors and a central location with respect to regional markets."

The relationship of the project to the provisions of the Urban Environment Element of the Novato General Plan are discussed above, in addition to the relationship of the project to the goals and policies of the City of Novato adopted Land Use Plan for Reuse of Portions of Hamilton Air Force Base. While the proposed project would not include a deep water port, in part because of the shallow conditions of San Pablo Bay and separation of the site from the Bay by the existing runways, the project would cater to the local and regional economic/labor market as outlined in Section 3.1.3, Employment, Housing and Population.

"New development is directed to existing developed areas to foster a pattern of compact growth. This pattern avoids development in hazardous areas, limits the costs of extending services, and will likely foster the use of transit (especially as residential development densities increase)."

The project would consist of reuse and development of a tract of land that has a history of intense military use. The extent to which the project would "foster the use of transit" is

unproven at this time, pending ultimate decisions to utilize the existing Northwestern Pacific Railroad right-of-way for public transit, which travels through the project site. The potential use of the Northwestern Pacific right-of-way for transit is discussed in Section 3.1.4, Traffic and Transportation.

"Compared to other counties there is little land available to support future economic growth. While any significant increase of economic activities could have fiscal advantages, the availability of jobs which provide employment opportunities to the resident labor force would be necessary to eventually reduce out-commuting. Whether the type or magnitude of job growth would be sufficient to have this effect remains to be seen. The expansion of job opportunities also offers the promise of reducing unemployment but, lacking the ability to afford housing in urbanized Marin, many new employees could be faced with regressive commuting costs as they commute into the area. Job growth in Marin may also offer opportunities to resident households seeking more than one source of income."

Employment opportunities in relation to the available local labor force is a significant issue with respect to the economic viability of the project. The issue of out-commuting and the provision of housing is also significant with respect to mitigating potential traffic impacts. In lieu of repeating these discussions here, the reader is referred to Section 3.1.3, Population, Housing and Employment, and Section 3.1.4, Traffic and Transportation.

¹The construction of housing for military families adjacent to the project site is currently underway by the U.S. Navy. Other facilities are proposed by the U.S. Navy for construction adjacent to the project site. This subject, because it relates heavily to land use and is not necessarily policy oriented, is discussed in Section 3.1.2, Land Use.

²City of Novato, Novato General Plan, Urban Environment Element, November, 1981.

³County of Marin, The Marin Countywide Plan, County-wide Plan Update Program, April 13, 1982.

⁴San Francisco Bay Conservation and Development Commission, San Francisco Bay Plan, July, 1979, as amended.

⁵ Association of Bay Area Governments, Regional Plan, 1980, San Francisco Bay Area, July, 1980.

⁶ The intent of the policy statement regarding civilian aviation use of Hamilton Field, at the time it was drafted, was to preclude civilian aviation use at Hamilton on the part of the City (and County). There was no consideration at that time of whether or not possible future private developers would be required to take specific actions to aid in precluding civilian aviation use. Therefore, although the project would not preclude civilian aviation use, the project is not considered to be in conflict with the policy.

3.1.2 LAND USE

SETTING

Urbanized land uses in Marin County, by policy and the availability of community services and utilities, have been concentrated along the eastern side of the County along the transportation spine of U.S. Highway 101, and to a lesser degree toward the shoreline of the Bay. The western part of the County remains largely agricultural with extensive areas of publicly owned open space. Although significant blocks of vacant land have been acquired in the U.S. 101 urban corridor for public ownership, the development of open fields and hills has resulted in concern for the remaining open spaces. This sensitivity has placed particular emphasis on protection of the remaining Bay wetlands and floodplains. Public policy at the Federal, State, and local levels significantly constrains construction in the Bay plain area (see Section 3.1.1, Planning and Relationship to Plans). This has put further pressure upon land zoned for development above the Bay plain within the urban corridor, particularly where the majority of land available for development exists in north Marin County.

Hamilton Field thus represents one of the larger land holdings potentially suitable for development that contains portions of the Bay plain lying north of San Rafael. Portions of the Hamilton Field property in the Bay plain have previously been developed with roadways, buildings and other military facilities. The project site is located within southern Novato, about 20 miles north of San Francisco (see Section 2.1, Location). While land use in the 101 urban corridor of Marin County is characterized primarily by residential development, it is the policy of the City of Novato and County of Marin to encourage commercial, business and industrial development that will reduce any "bedroom" status the County may retain within the San Francisco metropolitan area. Accordingly, Hamilton Field would function as an important mechanism in achieving this end (see Section 6.2, City of Novato Adopted Land Use Plan Alternative). The size of the project site would appear to afford the opportunity for the packaging and marketing of a planned community containing office, R&D and industrial uses supported by on-site housing as envisioned by the City of Novato (see Section 6.2, City of Novato Adopted Land Use Plan). The historical military/aviation land uses of the area could be viewed as establishing a precedent for light industrial land uses.

More specifically, Hamilton Field is bounded on the west by U.S. 101, along the east by San Pablo Bay, on the north by the Novato Creek Bay Plain and on the south by Pacheco Hill and the coastal Bay plain (Section 2, Project Description, Figure 2-2, Site Location Map). About 700 acres of Hamilton Field consisting of runways, apron, taxiways and aircraft dispersal area are in limited use by the Army (see Appendix A, History of Hamilton Field). About 87 acres of salt marsh exist at Hamilton Field on the periphery of San Pablo Bay. About 170-200 acres of the 452-acre project site are now highly developed with infrastructure, including multi-story buildings centered in the Old Headquarters Area. Additional portions of the project site have been used as barracks areas, for the storage of ammunition and fuels, machine shops, communications and other uses where the land is not as intensively developed as the Old Headquarters Area; a number of barracks buildings have been removed during the past year. Maintenance of numerous facilities has generally been suspended at Hamilton Field leading to increased dilapidation and disrepair of existing construction.

As noted previously (Section 2.4, Project Characteristics and Scheduling), there are ten parcels of land within and adjacent to the project site currently owned by the military totaling 50.7 acres of land. The Berg-Revoir Corporation is currently negotiating with military personnel for the transfer of these ten parcels to ownership by the Corporation and inclusion in the development area. This EIR includes the military inholdings within the overall project analysis. However, it must be recognized that the inholdings may or may not be secured by the project sponsors.

The existing Department of Defense family housing and associated support facilities east of Highway 101 comprise about 357 acres of urbanized land immediately south of the project site. This housing in the past had been close to the intensively used airfield, administration area and enlisted training activities at Hamilton Field, but to the extent land use conflicts existed regarding noise and visual access, these conflicts were accepted as a basic aspect of military life.

The Department of the Navy is currently constructing 300 housing units for Navy personnel on the military-owned lands bordering the south margin of the project site.¹ The Commissary Triangle on the north side of State Access Road, north of the Lanham Housing complex, is proposed to contain additional family housing on 12 acres of land to

be completed in 1995, and various Navy retail facilities and a new commissary would be provided in the existing area of Navy support services south of State Access Road to be completed in the 1990 to 1995 period.

Today, land uses surrounding Hamilton Field are more intense than in previous years. Multi-family housing has been constructed west of U.S. 101 fronting Alameda Del Prado (see Figure 2-3, Proposed Land Use Diagram), the Los Robles Mobile Home Park and Ignacio industrial area has been constructed immediately north of the project site, and residential construction within the Bel Marin Keys waterfront community has occurred directly northeast of the project site. Bel Marin Keys Unit 4 consisting of about 150 single-family detached homes was recently completed in early 1988, and the future of Bel Marin Keys Unit 5 consisting of upwards of 1,500 acres of land extending toward the runways of Hamilton Field has not yet been determined; however, it is likely that wetland, floodplain, agricultural and Bay shoreline regulatory constraints will ultimately determine the amount of land on which Bel Marin Keys Unit 5 may be built.

The Ignacio industrial area, located immediately north of Hamilton Field, has been developed primarily since 1970 and contains about 125 acres of land in three industrial parks: Hamilton Industrial Park, Bel Marin Commercial Park, and Ignacio Industrial Park. Occupants generally represent relatively small semi-commercial, light industrial and distributing activities. The Army Corps of Engineers required dedication of a major portion of the area for wetlands as mitigation for filling the area required for construction.

The hills of Big Rock Ridge lie west of Highway 101 across from Hamilton Field. Much of this land is owned by the County Open Space District, with the remaining land in private ownership within the City limits, and is zoned for residential and planned unit development. Rafael Village is a 505-unit military family housing area west of Highway 101, and is a part of Hamilton Field that is being retained by the Department of Defense. Extensive high-value subdivision development has occurred on the surrounding hillsides at the periphery of the Village. Further development west of Highway 101 is constrained by topography and open space policies.

The area to the south of Hamilton Field is primarily a continuation of the Bay plain, although Pacheco Hill forms a major barrier at the southwest corner of the Base. The Roman Catholic Archdiocese owns a 1,500-acre tract on the southern boundary of the Base occupied by St. Vincent's Boys School. This property and the adjacent Silveira Ranch lie in the unincorporated area between the City of Novato and the City of San Rafael and is zoned for agricultural uses. The area is included within the San Rafael Sphere of Influence, portions of which are indicated for residential and commercial development in the Draft San Rafael General Plan 2000.

East of the railroad right-of-way, the Land Use Plan Map designation is primarily for Agriculture/Recreation/Urban Reserve extending from the Sphere of Influence boundary in the north to McInnis Park in the south. No specific proposals for development in the St. Vincent/Silveira Ranch area have been established by the landowners at the time of EIR preparation.

The County Plan designates the lands south of Hamilton Field as a "business development area" with office uses and medium to high density housing.

Downtown Novato lies about four miles northwest of Hamilton Field. The downtown area consists of a pedestrian scale commercial zone that the City desires to preserve as an economically viable town center. A number of land parcels suitable for industrial and commercial development exist in the general area between Hamilton Field and downtown along the Highway 101 corridor. A regional shopping center and commercial/office space was proposed for development at the east end of the Rowland Boulevard/Highway 101 overpass about three miles north of Hamilton Field. The Rowland Plaza project consisting of movie theaters, fast food outlets and office space was recently approved by Novato for construction at that location.

IMPACTS

PROPOSED PROJECT

Development of the project site at Hamilton Field would have varying levels of impact on local and regional land uses. The nature of the impacts would range from physical impacts resulting from conditions relating to noise, traffic, population increases and the

local economy, energy consumption, visual conditions and other aspects of the environment as detailed in the respective technical sections of this EIR. This portion of the analysis will focus on the compatibilities of land use within the immediate project site area.

Aviation use at Hamilton has been raised as a public issue with respect to noise as being incompatible with surrounding land uses. However, noise setback zones are being respected in the project as described in section 3.2.5, Noise. Additionally, the project as proposed is not envisioned as precluding or assisting any potential future civilian use of the airstrip as explained in Section 3.1.1, Planning and Relationship to Plans. Although bird strikes with aircraft as a result of any increase in the bird population through the expansion of wetland habitat would conceivably be a concern to the Federal Aviation Administration, it is proposed that wetland habitat be recreated to compensate for the loss of wetland habitat on the site; this subject is discussed further in Section 3.2.3, Vegetation and Wildlife.

The Army intends to continue, for the foreseeable future, aviation operations appropriate to the aviation facilities currently present at Hamilton Field. The airfield with its associated hangar, is a subinstallation of the Presidio of San Francisco. With development of the project site as proposed, there would be an increase of the resident population as well as daily fluctuations of office and R&D workers. It therefore cannot be ruled out that unintentional (stray) and/or unauthorized access to the runway or other aviation facilities by pedestrians, vehicles and pets may occur. Unauthorized runway access could conceivably represent a hazard to both the trespassers as well as military aviation use of the runways, including any emergency runway use unless precautions are taken to prevent unauthorized and stray access to the existing aviation facilities. Public access along the dikes east of the runways to the Bay and/or wildlife refuge is not proposed, which would assist in preventing unauthorized access to the runways. Additionally, a ferry dock on the Bay edge which may otherwise be incompatible with aviation safety is not proposed.

The R&D activities proposed for the project would generate traffic, but would not in themselves constitute obnoxious neighbors such as heavy industrial land uses that generate airborne pollutants and manufacturing noise. Such "clean" light-industrial uses are typically contained wholly within single or multiple-structures to the exclusion of outdoor

materials storage or assembly yards. Additionally, office use can be considered a "passive" land use with office activities occurring within building interiors to the exclusion of more active outdoor uses such as major gaming or sporting events that would attract large crowds from a regional area; such sporting activities are not proposed for the project. To the extent project housing would encourage project site R&D and office workers to reside at Hamilton, traffic generation impacts would be correspondingly reduced (see Section 3.1.3, Employment, Housing and Population, and Section 3.1.4, Traffic and Transportation).

Residential development on the project site would reinforce the sense of residential community represented by the retained Department of Defense family housing, emphasizing a more compatible land use with the existing military housing and Lanham housing, than if no housing were proposed for the project. The southerly portion of the proposed housing would abut the existing military housing along a portion of Main Gate Road at WAF Hill, providing a continuation of housing land uses from the project site to off-site areas. Office/R&D development in the northwest portion of the site would continue the general pattern of development found in the Ignacio industrial area immediately to the north. However, the Lanham housing area would continue to remain as a segment of housing between Main Gate Road and the proposed office/R&D uses of the proposed project to the north (see Figure 2-3, Proposed Land Use Diagram), unless the Navy were to construct family housing in the Commissary Triangle as noted previously. If the Navy housing were to be constructed in the Commissary Triangle, this housing would essentially represent an extension of the Lanham housing complex south of State Access Road toward the project site. Project office/R&D uses would abut the Navy housing, but remain separated from the housing by the Northwestern Pacific Railroad right-of-way. Military support services including the Commissary may remain in place between the Lanham housing and proposed project housing east of the Northwestern Pacific Railroad right-of-way, although the project sponsor is negotiating with the military to relocate the Commissary within the general area. Correspondingly, the Lanham housing and military support services area north of Main Gate Road would continue to separate the project site from the existing military multi-family housing south of Main Gate Road and west of the Railroad right-of-way. Hospital and medical facilities would be located on the west margin of the project site, north of WAF Hill and away from the airstrip minimizing the effects of aircraft noise on medical services (see Section 3.2.5, Noise).

Should the military inholdings not be secured by the project sponsors, project development that surrounds the inholdings could be precedent setting on the ultimate use and development potential of the inholdings. To illustrate, an inholding that is surrounded by office/R&D use would need to be assessed for its compatibility with the surrounding office/R&D use when considered for development; to develop such a parcel with a manufacturing use that generates noise and odors could be incompatible with the surrounding office/R&D use. Similarly, to develop a small inholding with residential units (either for military housing or housing for the private sector), that is surrounded by R&D use may be infeasible given the specific nature and density of the R&D use. To develop the project site as a whole, including the military inholdings, would provide the opportunity to avoid discrepancies in function between adjacent parcels and allow for the coordination of site development that reduces or eliminates land use conflicts relating to circulation, noise, visual quality, air quality and the provision of utilities and public services.

One land use issue concerns the compatibility of the proposed project in relation to the development of Bel Marin Keys Unit 5. At the current time, Hamilton Field as it exists demonstrates no definitive conflict with the existing Bel Marin Keys community, except for the occasional noise of helicopter operations which are audible to the local population. While a specific proposal for the development of Bel Marin Keys Unit 5 is not actively under review by the County of Marin at this time, it appears that any potential land use conflicts between Unit 5 and Hamilton Field would not be related to the proposed Master Plan project itself. Rather, because the Unit 5 project area and Hamilton Field Master Plan project site are separated by the existing airstrip (runways) and perimeter dikes, Unit 5 and Hamilton Field land use conflicts are speculated to relate to safety and noise issues associated with existing use of the air strip and any potential future aviation use of the air strip. Unit 5 vehicular access either from Highway 37 to the north, along the existing Bel Marin Keys Boulevard, and/or through the proposed Master Plan project site would be a separate issue relating to transportation planning, but could have secondary land use impacts which would be tenuous to predict at this time. Logically, the decision on vehicular access location to Unit 5 would relate to the land uses proposed for Unit 5 (residential, recreation, retail/commercial) and their location, the extent of land use coverage envisioned and project density, such as the number of dwelling units that would be approved for development (potential access to Bel Marin Keys Unit 5 is discussed

further in Section 3.1.4, Traffic and Transportation). Additionally, any future development of the St. Vincent/Silveira property south of the project site would require the analysis of transportation planning and land use compatibility.

Because no specific plans for development of the St. Vincent/Silveira property have been presented, it appears that the Hamilton Field project would be established in advance of potential development to the south. The project would represent a continuation of previous construction to the north, most notably the Ignacio industrial area. If the St. Vincent/Silveira property were developed at this time, the reuse and redevelopment of Hamilton Field could be considered an infill project. Currently, the Hamilton Field project would comprise an intense mixed-use project extending urban development south toward the Bay plain and undeveloped agricultural lands north of the San Rafael City Limit.

ALTERNATIVE 1: DECREASED HOUSING, INCREASED JOBS

ALTERNATIVE 2: DECREASED HOUSING, DECREASED JOBS

ALTERNATIVE 3: INCREASED HOUSING, DECREASED JOBS

Land use impacts regarding the project as proposed would apply equally to the above three alternatives. Variations in land use intensity respecting the alternatives and existing abutting military parcels may or may not yield conflicting, adjacent land uses. Therefore, mitigation as applied to the proposed project would be required for the three alternatives as explained below.

MITIGATION MEASURES

PROPOSED PROJECT

As the various project construction phases are implemented over a nine to ten year period, periodic updates on the status of proposed land development surrounding the project site should be completed to avoid potential conflicts in land use. This would particularly relate to any vacant parcels that abut the project site and any military inholdings that may not be secured by the project sponsors. Planning for the area as a whole must take into account factors relating to land use compatibilities including transportation planning, noise, air quality, the provision of public services, the design and construction of utilities to avoid duplication and promote joint use consistent with existing service capabilities, the visual relationships between adjacent land uses,

drainage, habitat and other factors affecting the natural and constructed environment. The military's plans for ultimate disposition and/or use of the military inholdings should be ascertained at the earliest practicable time to ensure the coordination of land use with any contemplated military actions. Construction of the Hamilton Master Plan project would need to be coordinated with construction of the military improvements to avoid potential conflicts in land use, circulation, drainage, use of existing utilities and public services. Close coordination between the project sponsors and Naval Facilities Engineering Command will be required in this effort, including planning for any potential land exchanges and/or purchases of military inholdings. Adequate landscape buffers to provide a transition in land use could be required between any housing to be built within the Commissary Triangle and project office/R&D uses immediately to the east.

Coordination with the Army regarding continued and potential military airspace requirements as defined in Federal Aviation Regulations Part 77 should be maintained throughout the project planning process. The project design has incorporated R&D, light industrial, warehouse and open space land uses immediately adjacent to the Hamilton Field runway, which would serve as noise and activity buffers between the runway and residential neighborhoods. In addition, the Master Plan incorporates Hanger Road (the future McInnis Parkway arterial) between the R&D, light industrial and warehouse uses and residential land uses, providing further physical separation between the runway and residential portion of the project.

Private security and surveillance would be provided for the various land uses as portions of the project would be completed (see Section 3.1.5, Public Services). Although it is reasonable to assume the military will continue to provide security for the runway and military aviation facilities, to prevent unauthorized access by persons and pets onto the runways and within the military aviation facilities, adequate restrictions and caution signs should be installed between the proposed project and aviation use areas. The restrictions (barriers) should be constructed in such a way so as not to present an institutionalized, industrial or strictly functional appearance to achieve visual compatibility with the residential/office/R&D appearance of the proposed project and may consist of earth berms, shrubbery or other decorative plant materials to the extent military or FAA restrictions do not apply. Such landscape components may restrict unauthorized pedestrian and pet access, but may also contain and screen from view fencing that would

provide additional protection from deliberate access to the runway and military aircraft facilities. Site specific investigations for restrictive barrier design barrier would require an assessment of terrain conditions, drainage, existing vegetative cover, views, proposed circulation and surrounding existing and proposed land uses.

As project site-specific designs are completed, it is the project sponsor's intent to incorporate modified street right-of-way widths to limit potential street widening impacts (taking of land) on existing military neighborhoods and Lanham Housing residents (see also Section 3.2.5, Noise).

ALTERNATIVE 1: DECREASE HOUSING, INCREASED JOBS

ALTERNATIVE 2: DECREASED HOUSING, DECREASED JOBS

ALTERNATIVE 3: INCREASED HOUSING, DECREASED JOBS

Land use mitigation regarding the project as proposed would apply equally to the above three alternatives.

¹Western Division, Naval Facilities Engineering Command, San Bruno, California, Master Plan, Department of Defense Housing Facility, Novato, California, May, 1986.

SUMMARY COMPARISON OF IMPACTS AND MITIGATION MEASURES

3.1.2. LAND USE

	IMPACT	MITIGATION
PROPOSED PROJECT	Should the military inholdings not be secured by the project sponsors, project development surrounding the inholdings could be precedent setting on the ultimate use and development potential of the inholdings.	To develop the site as a whole, including the military inholdings, would provide the opportunity to avoid discrepancies in function between adjacent parcels and allow for the coordination of site development that reduces or eliminates land use conflicts. Periodic updates on status of proposed land development surrounding the project site should be completed to avoid potential conflicts in land use.
ALTERNATIVE 1: (Decreased Housing, Increased Jobs)	Impacts would be the same as for the proposed project.	Mitigation would be the same as for the proposed project.
ALTERNATIVE 2: (Decreased Housing, Decreased Jobs)	Impacts would be the same as for the proposed project.	Mitigation would be the same as for the proposed project.
ALTERNATIVE 3: (Increased Housing, Decreased Jobs)	Impacts would be the same as for the proposed project.	Mitigation would be the same as for the proposed project.

3.1.3 POPULATION, EMPLOYMENT, AND HOUSING

SETTING

Population Trends and Projections

Since 1980, population growth in Marin County has been much slower than in the remainder of the San Francisco Metropolitan Area and the State of California as a whole (see Table 3.1.3-1). Marin County's population grew by 2.3%, or 5,063 new residents, between 1980 and 1987. During the same time period the City of Novato's total population grew by 4.6%, or 2,034 residents, which was a faster rate than that of the County as a whole. Novato absorbed 40% of the County's total population growth. In comparison to the relatively slow growth rate of Marin County and the City of Novato, the State of California's population increased by 3.6 million people, which was a growth rate of 15.3% percent for the same time period.

Marin County also experienced a dramatic change in its population mix. Between 1980 and 1987 the population of Marin County grew older. Concurrently, there has been a dramatic decrease in the number of children. While the number of people sixteen years and older increased by 17,322 over the past seven years, the number of children under sixteen years of age declined by 12,259. Children in Marin County have grown up and entered the labor force, and have not been replaced by new children. Even the number of young adults (ages 16-24) has declined by 110 persons during the past seven years.

Marin County's net population growth has been due to the increasing number of persons in the prime working age of 25 to 54 years. This segment of the population has grown by 13,376 over the last seven years, a 12.7% increase. The other segment of Marin County's population growth has been among people 65 years and older. This group increased by 3,774 persons, or 17.6% during the past seven years.

Population in Marin County and the City of Novato is projected to grow more rapidly between 1990 and 2000 than it did during the past seven years. Between 1990 and 2000 Marin County's population is projected to grow by 18,400 persons, or 7.9% (see Table 3.1.3-2). In keeping with past trends Novato's population will continue to grow more rapidly than the County's. Novato's population is projected to grow by 8,800 persons, or 15.1% during the 1990s. Thus, Novato is projected to absorb 47.8% of the County's population growth over the next decade.

TABLE 3.1.3-1

POPULATION GROWTH IN MARIN COUNTY 1980 - 1987

	1980	1987	Total Growth 1980 - 1987	% Change 1980 - 87
Marin County Population	222,568	227,631	5,063	2.3%
Under 16	42,981	30,722	-12,259	-28.5%
16 - 19	13,451	14,641	1,190	8.8%
20 - 24	16,373	15,073	-1,300	-7.9%
25 - 54	105,713	119,089	13,376	12.7%
55 - 64	22,548	22,830	282	1.3%
65 & over	21,502	25,276	3,774	17.6%
Total 16 & Over	179,587	196,909	17,322	9.6%
City of Novato Population	43,916	45,950	2,034	4.6%

Sources: Applied Development Economics based on data collected from the 1980 U.S. Census and 1987 California Department of Finance Population Estimates.

NOTE: The California Department of Finance estimates Marin County's demographic characteristics. However, only total population estimates are available for the City of Novato. The next actual distribution of demographic data for the City of Novato will not be available until the 1990 Census.

TABLE 3.1.3-2

PROJECTIONS OF POPULATION GROWTH IN MARIN COUNTY AND NOVATO 1990-2000

	1990	2000	Total Growth 1990 - 2000	% Change 1990 - 2000
Marin County Population	232,100	250,500	18,400	7.9%
Under 20	48,600	47,300	-1,300	-2.7%
20 - 24	15,600	13,800	-1,800	-11.5%
25 - 54	113,500	119,500	6,000	5.3%
55 - 64	28,000	34,900	6,900	24.6%
65 & over	26,400	35,000	8,600	32.6%
Novato Population	58,400	67,200	8,800	15.1%

Source: Applied Development Economics based upon ABAG Projections 87. Data is unavailable for projected population distribution by age in the City of Novato.

The ABAG projections displayed in Table 3.1.3-2 shows that the number of children and young adults in Marin County will continue to decline. ABAG also projects that the number of persons over 65 years of age will increase by 32.6%, or 8,600 persons between 1990 and 2000. The number of retired persons and older workers are projected to increase in Marin County through the turn of the century.

Trends and Projections of Household Formation

Table 3.1.3-3 shows that the number of households in Novato grew by 6.6% between 1980 and 1985. Total households grew in Novato at approximately the same rate as in the San Francisco Metropolitan Area (6.3% per year), but almost twice as fast as South Marin County's growth rate of 3.3% during the five year period. In Sonoma County, however, there was a 13.7% increase in the number of households between 1980 and 1985. Essentially, the number of households grew twice as fast in Sonoma County as in Novato, and nearly four times as fast as in Marin County.

ABAG projects that Novato will experience an 18.4% increase in the number of households formed between 1990 and 2000, exceeding the 13.1% growth projected for the San Francisco Metropolitan Area, and substantially higher than Marin County's ten year household growth rate of 8.2%. Novato is projected to absorb 38.4% of Marin County's new housing between 1990 and 2000. ABAG also projects that the formation of new households in Novato will be slightly less than Sonoma County's projected growth rate of 22.5%.

Labor Force Trends and Projections

The changes that have occurred in Marin County's population mix also have also influenced the County's labor force trends. That is, the decline in the number of children, and the entry of an aging population into the labor force, has lead to a labor force that has grown more rapidly than the total population.

Table 3.1.3-4 shows that Marin County's labor force increased by 11,111 persons between 1980 and 1987, a growth of 9.1%. The total population increased by only 5,063 persons, a growth of 2.3% during the same period of time. Approximately 68% of Marin County's adult population is participating in the labor force.

TABLE 3.1.3-3

TRENDS AND PROJECTIONS OF HOUSEHOLD FORMATION IN NOVATO AND THE REGION, 1980-2000

	TRENDS			
	1980	1985	1980-1985 Growth	% Change 1980-1985
Novato	17,962	19,140	1,178	6.6%
South Marin	70,761	73,070	2,309	3.3%
Marin County	88,723	92,210	3,487	3.9%
Sonoma County	80,426	91,440	11,014	13.7%
San Francisco Bay Area	1,970,549	2,093,900	123,351	6.3%

	PROJECTIONS			
	1990	2000	1990-2000 Growth	% Change 1990-2000
Novato	21,400	25,330	3,930	18.4%
South Marin	76,370	82,660	6,290	8.2%
Marin County	97,770	107,990	10,220	10.5%
Sonoma County	145,920	178,810	32,890	22.5%
San Francisco Bay Area	2,264,190	2,561,190	297,000	13.1%

Source: Applied Development Economics based on ABAG Projections '87

TABLE 3.1.3-4

LABOR FORCE TRENDS IN MARIN COUNTY AND THE CITY OF NOVATO

Marin County Total	1980	1987	Total Growth 1980-1987	% Change 1980-1987
Total Population	222,568	227,631	5,063	2.3%
Population 16 Years & Over	179,587	196,909	17,322	9.6%
Total Labor Force	121,595	132,706	11,111	9.1%
Employed	116,810	128,387	11,577	9.9%
Unemployed	4,785	4,379	-406	-8.5%
Unemployment %	3.9%	3.3%		
Not in Labor Force	56,233	64,203	7,970	14.2%
Labor Force Participation Rate	67.7%	67.4%		
City of Novato	1980	1987	Total Growth 1980-1987	% Change 1980-1987
Total Population	43,916	45,950	2,034	4.6%
Population 16 Years & Over	32,802	34,321	1,519	4.6%
Total Labor Force	23,120	24,191	1,071	4.6%
Employed	20,949	23,268	2,319	11.1%
Unemployed	896	923	27	3.0%
Unemployment %	4.1%	3.8%		
Not in Labor Force	9,682	10,130	448	4.6%
Labor Force Participation Rate	70.5%	70.5%		
Remainder of Marin County	1980	1987	Total Growth 1980-1987	% Change 1980-1987
Total Population	178,652	181,681	3,029	1.7%
Population 16 Years & Over	146,785	162,588	15,803	10.8%
Total Labor Force	98,475	108,515	10,040	10.2%
Employed	95,861	105,059	9,198	9.6%
Unemployed	3,889	3,457	-432	-11.1%
Unemployment %	3.9%	3.2%		
Not in Labor Force	48,310	54,072	5,762	11.9%
Labor Force Participation Rate	67.1%	66.7%		

Sources: Applied Development Economics based on data collected from the 1980 U.S. Census, 1987 Population Estimates Prepared by the California Department of Finance, 1987 Labor Force Estimates Prepared by the California Employment Development Department, and the California Employment Development Department Report BLS 041: Claimants by Zip Code Within County.

Yet the number of employed residents in Marin County expanded more rapidly than the total labor force. A total of 11,577 additional Marin County residents found employment in the San Francisco Metropolitan Area which resulted in a reduction of Marin County's unemployment rate from 3.9% in 1980 to 3.3% in 1987.

There are only slight differences between the labor force trends in the City of Novato and the rest of Marin County. First, the unemployment rate is slightly higher in Novato than in the rest of Marin County; Novato's unemployment rate, however, is still a very low 4%, approximately 923 Novato residents being unemployed in 1987. Novato's labor force participation rate is higher than Marin County's, partly due to the fact that there are less retired people in the community than in the remainder of Marin County.

Table 3.1.3-5 shows that Marin County's labor force is projected to expand more rapidly than the growth of the adult population. Marin County's labor force is projected to grow by 12.3% between 1990 and 2000, but the adult population will increase by only 9.5%. The City of Novato will also experience a similar pattern of more rapid labor force growth than population growth.

Job Characteristics, Growth Trends and Projections

Table 3.1.3-6 displays a difference in the characteristics of jobs in Novato and Marin County. For example, Novato is a manufacturing center for Marin County, and 15.9% of Novato's jobs are in the manufacturing/wholesale sector, while only 10.1% of Marin County's jobs are in manufacturing/wholesale. Nearly one-third of Marin County's manufacturing/wholesale jobs are located in Novato. In addition, a total of 38.5% of Novato's employment is in the services sector, compared to 33.7% of the County's total. Nearly one-fourth of Marin County's services employment are located in Novato.

Table 3.1.3-7 displays both job growth trends and projections. Novato's total employment increased by nearly 30% between 1980 and 1985, exceeding Marin County's 19.2% employment growth rate. During this period manufacturing employment in Novato grew by 52.9%, retail trade employment increased by 42%, and other employment sectors grew

TABLE 3.1.3-5

LABOR FORCE PROJECTIONS IN MARIN COUNTY AND THE CITY OF NOVATO, 1990-2000

Marin County Total	1990	2000	Total Growth 1990-2000	% Change 1990-2000
Total Population	232,100	250,500	18,400	7.9%
Population 15 Years & Over	197,400	216,100	18,700	9.5%
Total Labor Force	138,700	155,700	17,000	12.3%
Employed	134,700	151,000	16,300	12.1%
Unemployed	4,000	4,700	700	17.5%
Unemployment %	2.9%	3.0%		
Not in Labor Force	58,700	60,400	1,700	2.9%
Labor Force Participation Rate	70.3%	72.0%		
City of Novato	1990	2000	Total Growth 1990-2000	% Change 1990-2000
Total Population	58,400	67,200	8,800	15.1%
Population 15 Years & Over	49,700	58,000	8,300	16.7%
Total Labor Force	34,900	41,800	6,900	19.7%
Employed	32,900	40,100	7,200	21.8%
Unemployed	2,000	1,600	-400	-16.4%
Unemployment %	5.6%	3.9%		
Not in Labor Force	14,800	16,200	1,400	9.7%
Labor Force Participation Rate	70.3%	72.0%		
South Marin County	1990	2000	Total Growth 1990-2000	% Change 1990-2000
Total Population	173,700	183,300	9,600	5.5%
Population 15 Years & Over	147,700	158,100	10,400	7.0%
Total Labor Force	103,800	113,900	10,100	9.8%
Employed	101,800	110,900	9,100	9.0%
Unemployed	2,000	3,100	1,000	49.9%
Unemployment %	2.0%	2.7%		
Not in Labor Force	43,900	44,200	300	0.6%
Labor Force Participation Rate	70.3%	72.0%		

Sources: Applied Development Economics based on data from ABAG Projections 87

NOTE: There is a significant difference between the City of Novato's total population data in Table 3-3 and Table 3-4. Table 3-3 uses U.S. Census and California Department of Finance data for the Novato City Limits; whereas Table 3-4 uses ABAG estimates of total population for the Novato Planning Area, which includes households outside the city limits.

TABLE 3.1.3-6

COMPARISON OF JOB CHARACTERISTICS
IN NOVATO AND MARIN COUNTY, 1985

SECTOR	NOVATO		MARIN COUNTY		% of Novato Jobs in Marin County
	Total Jobs	% Total	Total Jobs	% Total	
Agriculture/ Mining	60	0.3%	580	0.6%	10.3%
Manufacturing/ Wholesale	2,850	15.9%	9,220	10.1%	30.9%
Retail	4,050	22.6%	23,400	25.7%	17.3%
Services	6,910	38.5%	30,710	33.7%	22.5%
Other	4,070	22.7%	27,290	29.9%	14.9%
TOTAL	17,940	100%	91,200	100%	19.7%

Source: Applied Development Economics based on ABAG Projections '87

TABLE 3.1.3-7

JOB GROWTH TRENDS AND PROJECTIONS IN NOVATO AND MARIN COUNTY, 1990-2000

	Novato				% Change 1990-2000
	1980	1985	1990	2000	
Agriculture/Mining	68	60	60	60	0.0%
Manufacturing/Wholesale	1,864	2,850	3,660	5,300	44.8%
Retail	2,852	4,050	5,720	8,490	48.4%
Services	5,892	6,910	8,550	12,390	44.9%
Other	3,107	4,071	5,690	7,970	40.1%
Total	13,783	17,941	23,680	34,210	44.5%

	Marin County				% Change 1990-2000
	1980	1985	1990	2000	
Agriculture/Mining	621	580	520	490	-5.8%
Manufacturing/Wholesale	7,343	9,220	10,360	13,960	34.7%
Retail	19,852	23,400	28,610	34,350	20.1%
Services	26,818	30,710	34,590	40,870	18.2%
Other	21,868	27,290	33,920	36,330	7.1%
Total	76,502	91,200	108,000	126,000	16.7%

Source: Applied Development Economics based on ABAG Projections '87

by 31% in Novato. These sectors grew more rapidly in Novato than in Marin County. Services employment, however, grew by 17.3% which was a slower rate than the City's total employment growth. Agriculture/mining employment remained stagnant, actually declining by 8 jobs, or 11.8% of its 1980 total.

The projections of job growth in Novato will produce more dramatic changes than the past trends. Novato is projected to almost double its 1985 job base between 1990 and 2000. By the year 2000 Novato is projected to have 27% of the county's total job base.

Workforce Commute Patterns

Table 3.1.3-8 displays the trends and projections of the relationship between employed residents and jobs in Marin and Sonoma Counties. Approximately 36,900 workers living in Sonoma County in 1985 commuted to work elsewhere, mainly traveling south along Highway 101 through Marin County into San Francisco and the rest of the metropolitan area. The number of commuters leaving Sonoma County is projected to expand to 48,000 by the year 2000, which is an increase of 13.7% over the 1990 levels. In other words, Sonoma County's function as a bedroom community for employment centers elsewhere will continue to expand in the future.

The opposite situation is projected for the City of Novato. That is, nearly one-third of Novato's employed residents were commuting out of the City in 1985. However, the number of Novato's out-commuters is projected to decline from 11,000 in 1985 to 6,500 in 2000, a 40.1% drop. Consequently, the projected growth of jobs in Novato will lead to a significant decline in the net number of residents leaving the City for work elsewhere.

The remainder of Marin County will experience the reverse trends as the projected growth of jobs will not keep pace with the projected growth of employed residents. ABAG projects that the number of South Marin County workers who commute to jobs elsewhere will increase by 7.9% between 1990 and 2000. The data suggests that a reverse commute along Highway 101 from south to north will occur as Novato creates more jobs attracting some South Marin County workers.

TABLE 3.1.3-8

EMPLOYED RESIDENTS-JOB RELATIONSHIP IN MARIN AND SONOMA COUNTIES
TRENDS AND PROJECTIONS

	1985		1990		2000		% Change 1990-2000
	Employed Residents	Commute Out	Employed Residents	Commute Out	Employed Residents	Commute Out	
Novato	28,900	11,000	33,500	9,800	40,700	6,500	-33.7%
South Marin	98,200	24,900	103,400	19,100	112,400	20,600	7.9%
Marin County	127,100	35,900	136,900	28,900	153,100	27,100	-6.2%
Sonoma County	156,800	36,900	181,600	42,200	226,700	48,000	13.7%
San Francisco Bay Area	2,879,400	74,300	3,175,100	45,400	3,595,000	-118,000	13.2%

Source: Applied Development Economics based on data from ABAG Projections '87.

NOTES: Commute out is a net figure based upon the number of employed residents less the number of jobs in each subarea named above.

Housing on the Project Site

No persons reside on the Hamilton Field project site at the present time. The military barracks on the project site were used as residences for personnel prior to base deactivation in the 1970s. More recently, some barracks were used for short periods of time to house Afghan and Indochinese refugees.

Contiguous to the project site are residential areas containing a large number of dwelling units. The major residential development is the Department of Defense (DOD) housing area on the Hamilton Air Force Base (HAFB). This area contains approximately 1,300 dwelling units occupied by military personnel and their families. An additional 300 housing units are under construction.

The Lanham housing subdivision, a former military barracks area renovated for civilian occupancy, contains approximately 150 units, and is located north of the main entrance to the project site. The Lanham housing area is a valuable source of moderate cost housing in the Novato area. Another source of moderate cost housing is the Los Robles mobile home park immediately northwest of the project site off Nave Drive.

The Bel Marin Keys (BMK) subdivision, immediately north of the project site, currently contains approximately 550 units, with maximum development potential of up to 1,600 units. However, plans for future development of the subdivision have yet to be approved. Other nearby residential areas include single and multi-family housing to the southwest of the project site near the Alameda del Prado overpass, and similar housing located west of Highway 101 across from the project site.

Rental Housing Supply

The 1980 U.S. Census counted 15,493 dwelling units in Novato, of which 6,094 were rental units. Novato's total rental units represented 17.1% of the County's 35,537 rental units. Moreover, since 1970, rental housing supply in both Novato and Marin County has remained at about 40% of the total housing supply. This means that the number of total rental housing units in Novato has increased in accordance with the City's overall housing supply.

Jobs/Household Balance

The relationship of employment to household growth is often used as an indicator of a balance between the demand for housing and the supply of jobs in an area. This relationship is often expressed in terms of a ratio of total employment to dwelling units, employed residents to households, jobs to households, or a variation of these measurements.

Available data show that on the average there are 1.4 jobs per household in the San Francisco Metropolitan Area.¹ This means that, on-the-average, each household needs to have one full-time and one part-time worker in order to maintain the household's economic viability. A ratio of 1.4:1 indicates that a community is producing enough jobs for its employed residents. A ratio of less than 1.4 jobs per household indicates that a community is not producing enough jobs for its residents, who must therefore commute to work in the remainder of the metropolitan area. Ratios of less than 1.4:1 are generally reflective of conditions in a suburban community, while ratios of more than 1.4:1 are generally reflective of employment centers. San Francisco, for example, had a job-household ratio of 1.8:1 in 1985; Palo Alto had a ratio of 3.2:1, San Rafael had a ratio of 1.7:1; while the Petaluma area had a ratio of 0.8:1.

Table 3.1.3-9 displays past trends and projections of the job/household relationship in Novato, Marin County, and Sonoma County. The data indicates that there is an undersupply of jobs in Marin and Sonoma Counties, leading to an out-commute of workers. An examination of the most current data shows a large imbalance between jobs and households in all the jurisdictions of Marin and Sonoma Counties. For example, the 1985 jobs/household relationship in Marin County, was .99:1, which indicates an undersupply of jobs in Marin County forcing residents to commute to work in San Francisco and other parts of the metropolitan area. The 1985 jobs/household relationship in the City of Novato and in South Marin County closely resembles the county jobs/household relationship. More significantly, Sonoma County's 1985 jobs-households relationship was only .93:1, which indicates that Sonoma County has a greater undersupply of jobs than does Marin County.

TABLE 3.1.3-9

JOB-HOUSEHOLD RELATIONSHIP IN MARIN AND SONOMA COUNTIES

	1980 Ratio	1985 Ratio	1990 Ratio	2000 Ratio
Novato	.77:1	.94:1	1.11:1	1.35:1
South Marin	.89:1	1.00:1	1.10:1	1.11:1
Marin County	.86:1	.99:1	1.10:1	1.17:1
Sonoma County	.90:1	.93:1	.96:1	1.00:1
San Francisco Bay Area	1.28:1	1.34:1	1.38:1	1.45:1

Source: Applied Development Economics based upon ABAG Projections '87

NOTES: The ratios are a measure of the number of jobs per household. The regional average is approximately 1.4 jobs per household.

ABAG's projections for Marin and Sonoma Counties show an improvement in the jobs/household balance. Job expansion is projected to exceed household formation in Marin County, and by 2000 there will be 1.17 jobs/household. ABAG projects that job growth in the City of Novato will move the community more closely toward the regional average. By 2000 there will be 1.35 jobs/household produced in Novato which will lead to only a small net out commute of workers.

Little improvement, however, is projected for the Sonoma County jobs/household balance. The Sonoma County jobs/household balance is projected to improve to 1.0:1 by 2000. This means that Sonoma County will continue to experience a significant out-commute of residents.

Housing Affordability

Available data shows that Novato's housing stock has become more expensive relative to household income (See Table 3.1.3-10). The ratio of Novato's home values to income has increased from 2.48 to 1 in 1960 to 5.43 to 1 in 1980. Furthermore, since 1980 the price of housing has continued to increase more rapidly than incomes. Data collected by the Real Estate Research Council of Northern California shows that the price of a 1,500 square foot single family home in Novato increased by 15.7% between 1980 and 1987.² Yet, ABAG data suggests that mean household income in Novato increased only by 11.2% during the same time period.³

The same pattern of housing values rising faster than income is occurring in all of Marin County, and is creating a segmented home buyers market. The first segment of home buyers purchased their homes at a low price many years ago, have low mortgages, and have no incentive to move.

The second segment of home buyers would prefer single family homes but need at least a \$30,000 down payment and an annual household income of nearly \$50,000 in order to afford a 1,500 square foot single family home in Novato (See Table 3.1.3-11). Many of these home buyers already own a home and use their homeowners equity to make the down payment. Only a few first time home buyers have the capital resources needed to purchase their first home in Novato.

TABLE 3.1.3-10

INCOME AND HOME VALUES IN NOVATO
1960-1980*

	1960	1970	1980
	<hr/>	<hr/>	<hr/>
Median Household Income	7,156	12,014	24,529
Median Home Value*	17,750	30,250	133,300
Median Value:Income Ratio	2.48:1	2.52:1	5.43:1

Source: City of Novato Community Development Department, Housing Element Update, July 1984. Information derived from U.S. Census material for 1960, 1970, and 1980.

NOTES: Data reflects owner-occupied home values, as determined by the U.S. Bureau of Census. All Dollar Values in 1980 dollars.

TABLE 3.1.3-1*

COMPARISON OF HOUSING COSTS
AND INCOME NEEDED TO PURCHASE HOUSING IN MARIN AND SONOMA COUNTIES
(April 1987)

	House Price/1	Loan Amount 20 % down	Monthly Payment 10 % interest	Income Needed for Loan Qualification/2
San Rafael	\$178,000	\$142,400	\$1,250	\$54,500
San Anselmo	234,000	187,200	1,640	71,600
Novato	155,000	124,000	1,090	47,600
Petaluma	122,000	97,600	860	37,500
Santa Rosa	119,000	95,200	835	36,400

Sources: Applied Development Economics based on data published by the Real Estate Research Council of Northern California

NOTES: 1/ Housing prices are based on April 1987 data comparing houses of similar quality built at 1,500 square feet. The housing price data listed in this table is not a median or average value for each community. Instead, the housing price data shows the differences between the price of a similar quality house in each community listed above.

2/ Calculation of income required to qualify for a loan assumes that lenders will not allow borrowers to spend more than 27.5 percent of their income on housing. In fact, the amount of money lending institutions loan to individual borrowers for housing varies between 25 percent and 30 percent. ADE calculated an average of this criteria.

First time home buyers who do not have at least \$30,000 for a down payment on a home in Marin County comprise a third segment of home buyers. Some of the first time home buyers have decided to purchase lower priced homes outside of the City of Novato and Marin County. Other first time home buyers are willing to buy less space, namely a condominium or townhouse, in order to live in Marin County. Two bedroom townhouses can be purchased in Novato for \$110,000 or less with a down payment of about \$20,000, requiring an annual household income of between \$31,000 to \$37,000 in order to qualify for a loan.

Less expensive housing attracts homebuyers to Sonoma County. For example, a 1,500 square foot house in Petaluma costs \$122,000, 31,000 less than the same size house in Novato. The same house in Santa Rosa cost only \$119,000.⁴ While housing is less expensive in Sonoma than in Marin County, it will still require a \$40,000 household income and a \$25,000 down payment to purchase a 1,500 square foot home in either Santa Rosa or Petaluma. Even a small, 1,000 square foot home in Santa Rosa would require a \$30,000 household income and a \$20,000 down payment.

A final market segment of homebuyers is forced to rent due to the lack of capital resources or sufficient annual income to purchase housing. However, even rental housing in Novato became less affordable between 1970 and 1980. In 1970 only 28.2% of rental households were paying in excess of 25% of their gross monthly incomes on rent. But by 1980, 46.5% of the City's 6,094 rental households were paying in excess of 25% of their gross monthly incomes on rent.⁵

A 1986 Novato Chamber of Commerce report noted that, on average, one and two bedroom apartments rent from \$350 to \$710 per month, while two and three bedroom homes rent from \$725 to \$1,200 per month. In order to meet the federal standard of affordability, renters would need incomes ranging from \$14,000 to \$28,000 for the one and two bedroom apartments, and from \$29,000 to \$48,000 for the two and three bedroom homes.

Housing rents in Novato are expected to continue to rise beyond the federal standards of affordability even though the federal government has redefined the affordability level at 25 to 30% of a household's gross monthly income. ABAG's Projections 87 reports that

Novato's 1985 mean household income was \$46,100 per year. Accordingly, the annual mean rental household income is estimated at \$23,050, making affordable rents \$576 per month.⁶ The expected increase in future rent levels suggests that renters will have to pay a higher percentage of their incomes for housing in order to live in Novato.

IMPACTS

The development of the proposed Hamilton Field Master Plan will expand the total number of jobs in the City of Novato and Marin and Sonoma Counties, the jurisdictions that have expressed the greatest concern about the project. Construction of new housing at the project site will accompany the new jobs, and the creation of jobs and housing will attract new workers, who will bring their families and create a demand for additional housing, additional jobs for secondary workers, and additional public services. A detailed summary of the impacts that the proposed project and three alternatives would create on the concerned jurisdictions is provided in the following sections for summary of impacts (see Table 3.1.3-12).

PROPOSED PROJECT

Job Growth

The proposed Hamilton Field Master Plan calls for the development of 2.9 million square feet of office, industrial, and commercial space by 1997. When fully developed this project will accommodate 7,300 employees, of which 7,170 will be new. It is estimated that 130 of the Hamilton Field jobs will be created by the relocation of employees from the current Sutter Hospital site in Novato, to the new site at Hamilton Field.⁷ The project's preliminary phasing plan incorporates residential and employment uses in each phase. The project represents a change in the magnitude and rate of growth that ABAG has projected for Hamilton Field. See the Growth Inducing Section for a further discussion of the proposed project and ABAG data.

Table 3.1.3-13 displays the industry and employment distribution of the direct jobs created by the proposed Hamilton Field Master Plan. Business and financial service firms will accommodate 2,560 new jobs. Biotechnology and other scientific research fields will accommodate 1,410 new jobs. The Master Plan also calls for the construction of a hospital and medical support facilities which will create 1,400 jobs. Space for light industrial

TABLE 3.1.3-12

SUMMARY OF PROPOSED PROJECT AND ALTERNATIVES FOR THE HAMILTON FIELD MASTERPLAN

	Proposed Project	Alternative #1	Alternative #2	Alternative #3
Total Housing Units On Site	3,550	3,250	2,000	3,750
Rentals	2,600	2,300	1,550	2,800
Retirement	550	550	250	550
For Sale	400	400	200	400
Total Population On Site	7,610	6,960	4,290	8,040
Total Population 15 years and older	6,820	6,250	3,840	7,210
Total Labor Force	4,920	4,500	2,770	5,190
Employed	4,720	4,320	2,660	4,990
Unemployed	200	180	110	200
Not in Labor Force	1,900	1,750	1,070	2,020
Total New Jobs On Site	7,300	7,890	6,560	4,800
Resident Population working on site	1,230	1,330	1,100	810
Employed Residents Commuting off site	3,500	3,000	1,560	4,180
Households with Project Workers	920	1,000	830	610
Households with no Project Workers	2,630	2,250	1,170	3,140

Source: Applied Development Economics

TABLE 3.1.3-13

DISTRIBUTION OF EMPLOYMENT BY INDUSTRY AND OCCUPATION
FOR THE PROPOSED PROJECT AT HAMILTON FIELD

Land Use	Professional, Managerial, Technical	Clerical, Admin., Sales	Production	Other	Total
Office	1,020	1,410	100	20	2,560
Medical Research	410	230	190	20	840
Other Research	290	190	100	-	570
Industrial	180	130	380	10	700
Warehousing	100	180	110	-	390
Retail	70	210	80	100	450
Hotel	10	30	10	110	160
Hospital	190	60	10	60	320
Nursing/Treatment	230	40	30	560	860
Medical Offices	100	90	0	20	210
Project Wide	10	10	-	210	230
TOTAL	2,600	2,570	1,010	1,120	7,300
Percent Total	36%	35%	14%	15%	100%

facilities will accommodate 700 jobs; supporting warehousing facilities will accommodate 390 jobs; retail space will accommodate 450 jobs, and a hotel will create 160 new jobs. Finally, the proposed project will create approximately 230 supporting janitorial, cleaning, and office support jobs.

The data also shows that approximately 2,600, or 36% of the Hamilton Field jobs will be among the professional, managerial, and technical occupations. Equally important will be the clerical, administrative, and sales occupations, comprising 35% of the project total. There will be only 1,010 new jobs in the precision production, crafts, and repair occupations. The remainder of the project will create 1,120 jobs in various service, operators, fabricators, and labor occupations.

Furthermore, every job created at Hamilton Field will stimulate the creation of approximately two additional jobs through the multiplier process (See Table 3.1.3-14). For example, industrial activity at Hamilton will create the need for production supplies, distribution services, and possibly other services such as advertising that may be supplied by other firms in the Metropolitan Area. Similarly, the families of the project workforce will stimulate the need for additional retail and service jobs in the communities where they live.

ABAG's 1982 Input-Output Model provides a tool for estimating the distribution of secondary employment created by the proposed Hamilton Field Master Plan. Utilizing ABAG's input-output model ADE estimates that the proposed Master Plan will create 14,170 secondary jobs throughout the San Francisco Metropolitan Area. Approximately 1,610 secondary jobs will be located in the City of Novato, 7,900 jobs will be located throughout Marin County, and 4,180 secondary jobs will be located in Sonoma County. Only rough estimates of secondary employment can be made because it is not known what production relationships will develop between Hamilton employers and businesses in each jurisdiction.

Workforce Commute Patterns

The 7,300 Hamilton Field workers will commute from all over the San Francisco Metropolitan Area. Table 3.1.3-15 estimates that 28.1% of project workers will live

TABLE 3.1.3-14

ESTIMATE OF JOBS GENERATED BY PROPOSED HAMILTON FIELD MASTER PLAN

Job Characteristic	Direct Jobs	Total Secondary Employment	Secondary Employment in Novato (estimated)	Secondary Employment Marin County (estimated)	Secondary Employment Sonoma County (estimated)
Personal & Repair Services	230	390	50	220	110
Business and Professional Services	3,130	6,260	840	3,550	1,800
Health Services	2,110	4,240	320	2,280	1,310
Hotels & Lodging	160	210	40	130	60
Manufacturing, Medical & Professional equipment	1,090	2,530	300	1,420	740
Retail	450	540	60	300	160
TOTALS	7,170	14,170	1,610	7,900	4,180

Source: Applied Development Economics based on ABAG 1982 Input-Output Model and Economic Multipliers for the San Francisco Bay Region.

TABLE 3.1.3-15

RESIDENTIAL LOCATION OF HAMILTON WORKFORCE
(PROPOSED PROJECT)

Workers Residential Location	Percent	Number
On-site Housing	16.8%	1,230
Other Novato	11.3%	820
South Marin	16.9%	1,230
SUBTOTAL MARIN COUNTY	45.0%	3,280
San Francisco	8.0%	570
Sonoma County	36.0%	2,630
Napa/Vallejo	5.0%	360
Richmond/ Alameda County/ Other	5.0%	360
TOTAL WORKFORCE	99.0%	7,300

Source: Applied Development Economics.

Data based on employer and household surveys that collected data on workforce commute patterns and housing affordability, combined with estimates of project workers who will live at Hamilton Field; analysis discussed in text.

in Novato, with 16.8% of the project workers living in the new housing that will be built at Hamilton Field (please refer to Technical Background Document B for a description of the Methodology of this analysis). An additional 16.9% of the project workers will be living elsewhere in Marin County, creating a total of 45% of the project workers in Marin County. It is estimated that 36%, or 2,630 project workers, will commute to Hamilton Field from Sonoma County. The remaining project workers will commute to Hamilton Field from San Francisco (8%), Napa/Vallejo (5%), and the East Bay (5%).

The construction of new housing at Hamilton Field will also create a commute of workers from the project site to jobs elsewhere in the San Francisco Metropolitan Area. ADE estimates that 3,930 residents of Hamilton Field will commute out of the project site to work elsewhere (refer to Table 3.1.3-12 for calculation).

Population, Household Formation, and Labor Force Growth

The creation of 7,170 new jobs at Hamilton Field will increase the population, number of households, and the labor force supply in the City of Novato, south Marin County, and Sonoma County. Impacts will also occur in San Francisco, the East Bay, and Napa County, but the impacts will be relatively small.

The proposed project will attract job seekers from all over the Metropolitan Area to work at the project site. More than 80% of the new workers will seek housing at the project site, elsewhere in Novato, south Marin County, and Sonoma County. The project workers will bring their families with them, and form new households which will add additional persons to the labor force in each area. Additional impacts will occur in Novato from the construction of 3,550 new housing units. The new housing will attract residents who do not work at the project site, and expand Novato's population base beyond the project directed job creation impacts experienced by other areas.

Table 3.1.3-16 shows the impacts that the proposed Master Plan would have on the population, household formation, and labor force growth in the City of Novato and Marin and Sonoma Counties. The proposed Hamilton Field Master Plan will increase Novato's permanent resident population by 9,080 persons,⁸ and increase the total labor force by 5,640 workers. The new residents are projected to form 4,120 new households which will

TABLE 3.1.3-16

PROJECTIONS OF POPULATION, HOUSEHOLD FORMATION,
AND LABOR FORCE GROWTH CREATED BY THE
PROPOSED HAMILTON FIELD MASTER PLAN

	Novato	South Marin	Sonoma
	<hr/>	<hr/>	<hr/>
Residential Location of Project Workers	2,050	1,230	2,630
New Population Growth	9,080	1,970	5,010
New Household Formation	4,120	880	2,070
Labor Force Increase	5,640	1,280	2,720

Source: Applied Development Economics.

Data based on calculations of project worker residential location and ABAG Projections 87. Projections included in this table do not include the proposed project's effects on the Napa/Vallejo and East Bay areas. We estimate that less than 400 project workers will live in each of these areas creating a negligible impact on each area. Novato data includes workers living at Hamilton Field and the rest of Novato.

increase the demand to buy and rent dwelling units in Novato. The development of Hamilton Field will also increase South Marin County's permanent resident population by 1,970 persons, and increase the labor force by 1,280 persons. South Marin County's new residents are projected to form 880 households. Furthermore, Sonoma County will experience an increase of 5,010 new residents who will form 2,070 new households, and increase the labor force by 2,720 persons. Finally, the development of Hamilton Field will also lead to a less significant growth of population and labor force in San Francisco, Napa/Vallejo, and the East Bay.

Housing Supply and Demand

The proposed project plans to build 3,550 new housing units. The residential location analysis above indicates that project workers will occupy about 920 units, leaving an additional supply of 2,630 housing units at the project site for individuals and families in the regional labor force (refer to Table 3.1.3-12). Thus, the proposed project will provide housing for 2,630 households who would like to live in Novato. Approximately 3,150 housing units, or 89% of the total units will be placed on the rental market, which will increase the City's mix of rental housing units from 40% of the 1980 total housing supply to 45% of the total housing supply in the year 2000.⁹ Moreover, the new housing being proposed for Hamilton will expand Novato's housing stock by 30.7%.

Yet, even with an increase in the housing supply the proposed project will bring new households to Novato who will also demand new housing in the community. Approximately 580 project workforce households will seek housing outside of the Hamilton Field project, but within the Novato city limits. The proposed Master Plan will also create an additional demand for housing in Sonoma County and South Marin County. It is estimated that 2,630 project workers will live in Sonoma County, and they will form 2,070 new households who will seek housing in the area. It is also estimated that 1,230 project workers will live in South Marin County, and they will form 880 households who demand housing in the area.

In summary, the proposed project will result in an expansion of 2,630 additional housing units in Novato that are not being occupied by project workers. Approximately 570 housing units in Novato, located off the project site, will be demanded by project workers. Approximately 980 housing units will be demanded by project workers in South Marin County, and 2,070 units will be demanded in Sonoma County.

Housing Affordability

The proposed development of 3,150 rental housing units would primarily serve the middle and lower economic end of the housing market, and expand the supply of affordable housing at Hamilton Field. Affordability would be enhanced through the project sponsor's commitment to build 316 of the rental units at below market rates (BMR), in order to attract lower income families.

Table 3.1.3-17 shows that the rents for Hamilton Field housing will range from a high end of \$978 per month for an above average quality three bedroom house to a low end of \$540 per month for an average quality studio apartment. These rents suggests that households need to earn an annual income of \$21,600 in order to afford a \$540 per month studio apartment, while household income of \$39,120 per year is needed to afford the rents of a three bedroom house at Hamilton.

Thus, the BMR program is being established in order to promote affordable housing. Yet, Table 3.1.3-18 indicates that the BMR rent is nearly identical to the market rate rent for the average quality studios, and that the BMR program will have a greater impact on the rents of large above quality units than for the smaller average quality units.

While most of the Hamilton Field workers will be able to afford rental housing on site, Table 3.1.3-19 shows that nearly 1,300 project workers, or 17.7% of the Hamilton Field workforce is projected to earn less than \$22,000 per year, and will be unable to afford the minimum of \$540 per month to rent a studio apartment at Hamilton Field. Therefore, it is likely that at least 15% of the Hamilton Field workforce will seek more affordable housing off-site, perhaps out of the County, probably in Sonoma County and the East Bay.

Moreover, a segment of Novato's current residents would be unable to afford the rents at the project site. As recently as 1985 the estimated income of Novato' renters was only \$23,050, which means that the average renter can only afford the smallest units on site. Conversely, the project housing will attract other Marin County residents who have higher incomes and can afford some of the larger units. Sonoma County incomes tend to be significantly lower than those in Novato, however, and it is unlikely that many Sonoma residents would be encouraged to move into Hamilton rental units.

TABLE 3.1.3-17

INCOME STANDARDS FOR RENTAL UNITS

UNIT MIX 1: AVERAGE QUALITY UNITS

UNIT TYPE	RENT/ MONTH	RENT/ INCOME RATIO	INCOME REQUIRED
STUDIO	\$540	30%	\$21,600
1 BEDROOM	683	30%	\$27,320
2 BEDROOM	713	30%	\$28,520
3 BEDROOM	850	30%	\$34,000

UNIT MIX 2: ABOVE AVERAGE QUALITY UNITS

STUDIO/JR 1-BDRM	\$660	30%	\$26,400
1 BEDROOM	788	30%	\$31,520
2 BEDROOM/1 BATH	903	30%	\$36,120
2 BEDROOM/2 BATH	945	30%	\$37,800
3 BEDROOM	978	30%	\$39,120

Source: Applied Development Economics

Based on rents developed by Lynn Sedway & Associates. Rent/Income ratio standard determined by Federal Government.

TABLE 3.1.3-18

MARIN COUNTY INCOME STANDARDS FOR LOWER INCOME BMR UNITS

Family Size	Low Income Standards	BMR Rents
1 person household	\$21,300	\$532
2 persons	\$24,300	\$607
3 persons	\$27,350	\$684
4 persons	\$30,400	\$760
5 persons	\$32,300	\$807

Source: Applied Development Economics based on data supplied by the Marin County Community Development Department.

Very low income levels under the County guidelines range from \$15,600 to \$24,100.

Calculations of allowable rents for the BMR units are based on a 30 percent rent-to-income ratio.

TABLE 3.1.3-19

PROJECTED HOUSEHOLD INCOME DISTRIBUTION
OF THE HAMILTON WORKFORCE

(Figures are number of workers and percent within occupational categories)

OCCUPATION CATEGORY	< \$22,000	\$22,000- \$44,000	\$44,000- \$66,000	>\$66,000	TOTAL
Professional, Managerial, Technical	310 11.9%	910 34.9%	600 22.9%	790 30.3%	2,600 100.0%
Clerical, Administrative, Sales	540 21.1%	1,150 44.7%	540 21.1%	340 13.1%	2,570 100.0%
Production	250 25.0%	590 58.3%	170 16.7%	0 0.0%	1,010 100.0%
Other	190 16.7%	940 83.3%	0 0.0%	0 0.0%	1,122 100.0%
TOTAL WORKFORCE	1,290 17.7%	3,580 49.0%	1,310 17.9%	1,120 15.4%	7,300 100.0%

Source: Applied Development Economics. Data based on occupational distribution of Hamilton Field employment, and occupational wage data collected through ADE's resident surveys.

The affordability level for the 400 for-sale housing units will not be significantly different from the affordability of the rental units, except for the studio apartments. Table 3.1.3-20 indicates that household incomes needed to purchase the Hamilton Field units will range between \$25,000 and \$40,000, depending on the qualifying criteria used by the lending institution. Whether a family will rent or buy a home will depend, obviously, on whether it can make a down payment. While the construction of 400 new for sale units on the site will increase the lower priced homeownership opportunities in Novato, it should have a negligible impact on affordability of other housing in the City. The increased demand for housing generated by the project workforce would offset the beneficial price effects of the increased housing supply of Hamilton Field. Setting aside 40 new housing units for moderate income households will have a beneficial but small impact on the overall supply of affordable housing in Novato.

Finally, the proposed project will increase the population of the San Francisco Metropolitan Area, which, in turn, will push prices upward, making housing less affordable. For example, project workers will generate an 8% increase in Sonoma County's demand for housing. The other areas will experience a smaller increase in the demand for housing.

Right of First Refusal Program

The proposed project would provide work opportunities for an estimated 11,065 employees as discussed previously. However, workers employed in north Marin that commute from Sonoma County could aggravate the existing morning southbound and evening northbound commute, which is currently a problem in north Marin County. It is the project sponsor's intent to minimize adverse impacts on freeway commuting through the provision of rental housing with the first right of refusal to be given to those who would work at Hamilton Field (traffic impacts are discussed in Section 3.1.4, Traffic and Transportation). A second right of refusal is being considered by the project's sponsor for those persons who would work within a 1.5 mile radius of the Nave Drive/State Access Road intersection, since such persons would have a short trip to work and would generally not need to commute on U.S. 101.

Table 3.1.3-20

INCOME REQUIRED FOR FOR SALE UNITS

UNIT TYPE	TOTAL PRICE	PERCENT DOWN PYMT	LOAN AMOUNT	INTEREST RATE	AMORTI- ZATION PERIOD	MONTHLY PAYMENT	QUALI- FYING RATIO (a)	QUALI- FYING INCOME	QUALI- FYING RATIO (a)	QUALI- FYING INCOME
UNIT MIX 1: TOWNHOMES										
1 BEDROOM	\$88,000	20%	\$70,400	10.00%	30	\$617.81	25%	\$29,653	30%	\$24,712
2 BEDROOM	\$98,000	20%	\$78,400	10.00%	30	\$688.02	25%	\$33,025	30%	\$27,521
2 BEDROOM	\$110,000	20%	\$88,000	10.00%	30	\$772.26	25%	\$37,069	30%	\$30,891
Total	\$100,800	20%	\$80,640	10.00%	30	\$707.67	25%	\$33,968	30%	\$28,307
UNIT MIX 2: PATIO/ZERO-LOT-LINE										
2 BEDROOM	\$120,000	20%	\$96,000	10.00%	30	\$842.47	25%	\$40,438	30%	\$33,699
2 BEDROOM	\$143,000	20%	\$114,400	10.00%	30	\$1,003.94	25%	\$48,189	30%	\$40,158
3 BEDROOM	\$158,000	20%	\$126,400	10.00%	30	\$1,109.25	25%	\$53,244	30%	\$44,370
Total	\$136,050	20%	\$108,840	10.00%	30	\$955.15	25%	\$45,847	30%	\$38,206
TOTAL PROJECT	\$109,613	20%	\$87,690	10.00%	30	\$769.54	25%	\$36,938	30%	\$30,782

(a) Applied to mortgage payment only. Equivalent to approximately four to five percent greater qualifying ratio as applied to principal + interest + taxes (@ approx. 1.1%) + insurance (@ approx. \$500-\$600/yr.).

For the housing right of refusal program, there are a number of considerations to be taken into account. Considerations include the fact that there could be multiple wage earners within one family. The right of refusal would apply to a household secondary wage earner working at Hamilton. The program would not apply to a household if only a household minor worked part time at Hamilton while the parents worked full time elsewhere off-site (unless within 1.5 miles of the Nave Drive/State Access Road intersection). Household residency would be maintained if the job(s) at Hamilton were terminated for any reason. The right of refusal would apply to unmarrieds living together.

For the program to work successfully, additional considerations may be warranted. Guidelines to implement the program and ensure its continued operation may be required in the household rental/sales agreements, pending further investigation by the project sponsor. Additionally, it may be advisable for the project sponsor to work with housing agencies, non-profit housing organizations and community organizations to ensure that members of groups which traditionally have experienced housing descrimination and might not otherwise learn of housing opportunities at Hamilton, will receive information about available housing units at Hamilton Field and have the opportunity to apply for such units on a first come, first served basis within the appropriate priority categories. It may also be appropriate to retain a portion of the project units outside the right of first refusal program which would be available on a first come, first served basis to all persons who qualify on economic criteria.

Jobs/Household Balance

The proposed project will generate 7,170 new jobs and build 3,550 new housing units at the project site. Thus, the project will create 2 jobs for every household formed on the project site, and will affect the jobs/household balance in both the City of Novato and Marin County.

Specifically, ABAG's data measures .94 jobs for every household in Novato during 1985; ABAG projects 1.11 jobs per household by 1990, and 1.35 jobs per household by 2000, meaning that ABAG projects Novato's jobs housing balance to shift more closely toward the regional average. However, built into the ABAG projections are less jobs and housing for Hamilton Field than are proposed by the project sponsor. ABAG projected the growth of only 2,698 jobs and 852 housing units at Hamilton Field between 1990 and 2000, a significantly smaller scale project than the proposed project and all proposed alternatives.

The impacts of the proposed project on the jobs/household balance in Novato and Marin County can be calculated by subtracting the amount of growth that ABAG projects for Hamilton Field and adding the growth that will be created by the proposed project. If no new development is allowed on Hamilton Field then ABAG's projections for Novato in the year 2000 would be 1.29 jobs per household, and the development of the proposed project would shift Novato's projections 2000 to 1.38 jobs per household. In summary, the proposed project would shift Novato's jobs/household balance from 1.29:1; with no Hamilton project, this balance would shift to 1.38:1 for the planned project by the year 2000.

A similar analysis for Marin County shows that the proposed project will have a smaller impact on Marin County's jobs/household balance. ABAG projects that there will be 1.11 jobs per household in Marin County during 1990, and 1.17 jobs per household by the year 2000, marking a shift toward the regional average. If no development were allowed on Hamilton Field, ABAG's year 2000 projections for Marin County would shift to 1.15 jobs per household, and the development of the proposed project would shift Marin County's projections for the year 2000 to 1.18 jobs per household.

ALTERNATIVE 1: DECREASED HOUSING, INCREASED JOBS

Job Growth

Project Alternative 1 proposes to build 3.5 million square feet of office, industrial, and commercial space between 1990 and 2000. Full utilization of the space will accommodate 8,090 employees, of which 7,960 would be in new jobs (130 jobs will be moved from the existing Sutter Hospital).

Table 3.1.3-21 shows that Alternative 1 would result in the creation of 790 additional direct jobs, and 1,570 more secondary jobs than would be created by the proposed project, for a total increase of 2,360 jobs. Alternative 1 would create 1,000 more direct and indirect jobs in Novato than would be created by the proposed project. In addition, Alternative 1 would create 670 more secondary jobs in South Marin County and 460 more secondary jobs in Sonoma County than would be created by the proposed project.

Table 3.1.3-22 shows the breakdown of employment by industry and occupation for the direct jobs created by Alternative 1, and compares the employment distribution to the

TABLE 3.1.3-21

TOTAL EMPLOYMENT CREATED BY ALTERNATIVE #1
COMPARED TO PROPOSED PROJECT

	Alternative #1	Proposed Project	Change
Direct Jobs	7,960	7,170	790
Total Secondary Jobs (Estimated)	15,740	14,170	1,570
Estimated Secondary Jobs (Located in Novato)	1,820	1,610	210
Estimated Secondary Jobs (Located in Marin County)	8,780	7,900	880
Estimated Secondary Jobs (Located in Sonoma County)	4,640	4,180	460
Total Jobs (Estimated)	23,700	21,340	2,360

Source: Applied Development Economics

TABLE 3.1.3-22

EMPLOYMENT DISTRIBUTION OF ALTERNATIVE #1
COMPARED TO PROPOSED PROJECT

LAND USE	Alternative #1	Proposed Project	Change	OCCUPATION	Alternative #1	Proposed Project	Change
Office	3,300	2,560	740	Professional, Managerial, Technical	2,900	2,600	300
Medical Research	840	840	0				
Other Research	570	570	0	Clerical, Administrative, Sales	2,980	2,570	410
Industrial	700	700	0				
Warehousing	400	400	0	Production	1,040	1,010	30
Retail	450	450	0	Other	1,170	1,120	50
Hotel	160	160	0				
Hospital	320	320	0				
Nursing/Treatment	860	860	0				
Medical Offices	210	210	0				
Project Wide	280	230	50				
TOTALS	8,090	7,300	790		8,090	7,300	790

Source: Applied Development Economics

proposed project. The only significant difference between Alternative 1 and the proposed project is in the office category where an additional 200,000 square feet of office space is being proposed to accommodate 740 additional office employees.

The increase in office employment will expand clerical, administrative, and sales occupations by 400 more jobs than the proposed project. Professional, managerial, and technical occupations would also expand by 300 jobs. Production and other occupations would barely expand by about 80 jobs.

Workforce Commute Patterns

Table 3.1.3-23 compares the commuting patterns of Hamilton Field workers under Alternative 1 with the commuting patterns that would be established under the proposed project. In summary, more workers will commute to Hamilton Field under Alternative 1 than under the proposed project, but Alternative 1 would lead to less workers commuting out of Hamilton Field. Approximately 5,640 workers will commute each day into Hamilton Field under Alternative 1 compared to the proposed project's 5,250 workers. Approximately 280 additional commuters will travel to Hamilton Field from Sonoma County, and 180 additional commuters will travel the reverse commute from South Marin County to Hamilton Field. Alternative 1 would lead to approximately 3,000 residents who commute to work off-site compared to 3,500 residents who would commute off-site under the proposed project.

Population, Labor Force, and Household Growth Patterns

Table 3.1.3-24 shows that Alternative 1 will increase Novato's permanent resident population by 8,590 persons. Novato's new residents would form 3,880 new households, and approximately 5,340 of the new residents would join the labor force. There would be fewer new residents and households formed in Novato under Alternative 1 than under the proposed project since Alternative 1 proposes fewer housing units for Hamilton Field.

The increased jobs proposed for Alternative 1, however, would cause an expanded number of residents to move to Sonoma County and South Marin County. That is, Alternative 1 would lead to the formation of 1,060 new households, and 2,360 new residents in South Marin County. Approximately 180 additional households would be formed in South Marin

TABLE 3.1.3-23

RESIDENTIAL LOCATION OF PROJECT WORKFORCE
COMPARISON OF ALTERNATIVE #1 WITH PROPOSED PROJECT

LOCATION	% Distribution	Alternative #1	% Distribution	Proposed Project	Change
On-site Housing	16.3%	1,320	16.8%	1,230	90
COMMUTING TO HAMILTON FIELD FROM:					
Other Novato	11.4%	920	11.3%	830	90
South Marin County	18.3%	1,480	17.8%	1,300	180
San Francisco	8.0%	650	8.0%	580	70
Sonoma County	36.0%	2,910	36.0%	2,630	280
Napa County/Vallejo	5.0%	400	5.0%	360	40
East Bay/Other	5.0%	400	5.0%	360	40
SUBTOTAL:					
COMMUTING TO HAMILTON FIELD FROM OUTSIDE OF NOVATO	-	5,640	-	5,250	390
SUBTOTAL:					
LIVING AT HAMILTON FIELD BUT COMMUTING OFF-SITE	-	3,000	-	3,500	-500

Source: Applied Development Economics based on data from employer survey and housing affordability analysis.

NOTE: Refer to Table 12 for summary data on Hamilton Field residents who will commute off site.

TABLE 3.1.3-24

POPULATION, LABOR FORCE, AND HOUSEHOLD IMPACTS:
COMPARISON OF ALTERNATIVE #1 WITH PROPOSED PROJECT

Growth Created by Alternative #1

	Novato	South Marin County	Sonoma County
Residential Location of Project Workers	2,240	1,480	2,910
Population Growth	8,590	2,360	5,550
Household Formation	3,880	1,060	2,290
Labor Force Increase	5,340	1,530	3,010

Growth Created by Proposed Project

	Novato	South Marin County	Sonoma County
Residential Location of Project Workers	2,050	1,300	2,630
Population Growth	9,080	2,080	5,010
Household Formation	4,120	980	2,070
Labor Force Increase	5,640	1,350	2,720

Difference Between Alternative #1 and Proposed Project

	Novato	South Marin County	Sonoma County
Residential Location of Project Workers	190	180	280
Population Growth	-490	280	540
Household Formation	-240	80	220
Labor Force Increase	-300	180	290

Source: Applied Development Economics

County under Alternative 1 than under the proposed project. Furthermore, Alternative 1 would lead to an increase of 2,290 new households and 5,550 new residents in Sonoma County. Approximately 280 more households would be formed in Sonoma County under Alternative 1 than under the proposed project.

Housing Supply and Demand

Alternative 1 proposes to build 3,250 new housing units on the project site which would result in 300 less housing units than would be built under the proposed project. Project workers would occupy 1,000 units (including 28 senior units), leaving an additional supply of 2,250 housing units at the project site for individuals and families in the regional labor force.

Alternative 1 proposes to create 590 more direct jobs in Novato than the proposed project, leading to an extra demand for 630 housing units in the rest of Novato (outside of the project area), even though there will be 3,250 new housing units built at the project site. The expanded number of jobs at the project site will also increase the demand for housing in neighboring counties. Approximately 220 more households will be formed in Sonoma County under Alternative 1 than under the proposed project. Approximately 180 more households will be formed in South Marin County under Alternative 1 than under the proposed project.

In summary, Alternative 1 will result in an expansion of 2,250 additional housing units in Novato that are not being occupied by project workers. Approximately 630 housing units in Novato, located off the project site, will be demanded by project workers. Approximately 1,060 housing units will be demanded by project workers in South Marin County, and 2,290 units will be demanded in Sonoma County.

Housing Affordability

Alternative 1 would reduce the number of rental units by 300 in comparison with the proposed project. This would create a marginally less positive impact on housing affordability in Novato. At the same time the alternative increases the number of workers, which places further pressure on regional housing markets, particularly in Marin and Sonoma Counties. Overall, in relation to the proposed project, this alternative would have a small but definite adverse impact on housing affordability.

Jobs/Household Balance

Alternative 1 will generate 7,890 new jobs, and build 3,250 new housing units at the project site. Thus, Alternative 1 will create 2.4 jobs for every household formed on the project site, compared to 2 jobs for every household formed by the proposed project.

Accordingly, Alternative 1 would shift Novato's jobs/household balance from 1.29:1 with no Hamilton project to 1.42:1 by the year 2000. In comparison, the proposed project would shift Novato's jobs/household balance to 1.38:1 by the year 2000. Moreover, Alternative 1 would shift Marin County's jobs/housing balance from 1.15 jobs per household with no Hamilton project to 1.19 jobs per household. In comparison, the proposed project would shift Marin County's projections for the year 2000 to 1.18 jobs per household.

ALTERNATIVE 2: DECREASED HOUSING, DECREASED JOBS

Job Growth

Project Alternative 2 proposes to build 2.87 million square feet of office, industrial, and commercial space between 1990 and 2000. Full utilization of the space will accommodate 6,560 employees, of which 6,430 would be in new jobs (130 jobs will be moved from the existing Sutter Hospital).

Table 3.1.3-25 shows that Alternative 2 would result in the creation of 610 less direct jobs, and 1,310 less secondary jobs than under the proposed project. Thus, project Alternative 2 would result in the creation of 1,920 less total jobs than the proposed project. Alternative 2 would create 750 less direct and indirect jobs in Novato than would be created by the proposed project. Alternative 2 would also create 740 less secondary jobs in south Marin County and 380 less secondary jobs in Sonoma County than would be created by the proposed project.

Table 3.1.3-26 shows the breakdown of employment by industry and occupation for the direct jobs created by Alternative 2, and compares the employment distribution to the proposed project. The differences between Alternative 2 and the proposed project are in the industrial, warehousing and retail categories, where the programs have all been reduced. Project Alternative 2 would result in a decline of retail trade employment by 270 jobs. Nursing and treatment services would decline by 180 jobs, warehousing would decline by 130 jobs, and industrial uses would decline by 120 jobs.

TABLE 3.1.3-25

TOTAL EMPLOYMENT CREATED BY ALTERNATIVE #2
COMPARED TO PROPOSED PROJECT

	Alternative #2	Proposed Project	Change
Direct Jobs	6,560	7,170	-610
Total Secondary Jobs (Estimated)	12,860	14,170	-1,310
Estimated Secondary Jobs (Located in Novato)	1,470	1,610	-140
Estimated Secondary Jobs (Located in Marin County)	7,160	7,900	-740
Estimated Secondary Jobs (Located in Sonoma County)	3,800	4,180	-380
Total Jobs (Estimated)	19,420	21,340	-1,920

Source: Applied Development Economics

TABLE 3.1.3-26

EMPLOYMENT DISTRIBUTION OF ALTERNATIVE #2
COMPARED TO PROPOSED PROJECT

LAND USE	Alternative #2	Proposed Project	Change	OCCUPATION	Alternative #2	Proposed Project	Change
Office	2,560	2,560	0	Professional, Managerial, Technical	2,450	2,600	-150
Medical Research	840	840	0				
Other Research	570	570	0	Clerical, Administrative, Sales	2,350	2,570	-220
Industrial	580	700	-120				
Warehousing	260	390	-130	Production	850	1,010	-160
Retail	180	450	-270	Other	910	1,120	-210
Hotel	120	160	-40				
Hospital	320	320	0				
Nursing/Treatment	680	860	-180				
Medical Offices	220	210	10				
Project Wide	230	230	0				
TOTALS	6,560	7,290	-730		6,560	7,300	-740

Source: Applied Development Economics

The decrease in jobs that would be created under Alternative 2 would shift a small portion of the workforce out of production occupations and into professional, managerial and clerical jobs, and result in an employment decline in all occupational categories. Approximately 220 less jobs would be created in the clerical, administrative, and sales occupations; 210 less jobs would be created in other occupations, 160 less jobs in production occupations, and 150 less jobs in professional, managerial, and technical occupations.

Workforce Commute Patterns

Table 3.1.3-27 compares the commuting patterns of Hamilton Field workers under Alternative 1 with the commuting patterns that would be established under the proposed project. Alternative 2 is a smaller scale project, meaning that there will be less commuting to and from the project site than under the proposed project. Approximately 4,540 workers will commute each day into Hamilton Field under Alternative 2, as compared to the proposed project's 5,250 commuting workers. Under Alternative 2 there will be approximately 240 less commuters traveling to Hamilton Field from Sonoma County, and there will be approximately 50 less commuters traveling from south Marin County. Due to less housing being built under Alternative 2 there would be approximately 1,560 residents commuting to work off-site, as compared to the 3,500 residents who would commute off-site under the proposed project.

Population, Labor Force, and Household Growth Patterns

Table 3.1.3-28 shows that Alternative 2 will increase Novato's permanent resident population by 5,700 persons. Novato's new residents would form 2,520 new households, and approximately 3,540 of the new residents would join the labor force. However, the difference in impacts on Novato between the smaller scaled project Alternative 2 and the proposed project are significant. The adoption of Alternative 2 rather than the proposed project would result in 3,380 less residents and 1,600 less households.

While Alternative 2 would also increase Sonoma and South Marin County's population base, and expand the household formation in each jurisdiction, the impacts would be smaller than under the proposed project. The adoption of Alternative 2 would lead to 190 less households in Sonoma County, and 90 less households in South Marin County. Population and labor force would also decline proportionately.

TABLE 3.1.3-27

RESIDENTIAL LOCATION OF PROJECT WORKFORCE
COMPARISON OF ALTERNATIVE #2 WITH PROPOSED PROJECT

LOCATION	% Distribution	Alternative #2	% Distribution	Proposed Project	Change
On-site Housing	14.1%	920	16.8%	1,230	-310
COMMUTING TO HAMILTON FIELD FROM:					
Other Novato	11.7%	770	11.3%	830	-60
South Marin County	19.0%	1,250	17.8%	1,300	-50
San Francisco	8.0%	520	8.0%	580	-60
Sonoma County	36.4%	2,390	36.0%	2,630	-240
Napa County/Vallejo	5.4%	350	5.0%	360	-10
East Bay/Other	5.4%	350	5.0%	360	-10
SUBTOTAL:					
COMMUTING TO HAMILTON FIELD FROM OUT OF NOVATO		4,540		5,250	-710
SUBTOTAL:					
LIVING AT HAMILTON FIELD BUT COMMUTING OFF-SITE		1,560		3,500	-1,940

Source: Applied Development Economics based on data from employers survey and housing affordability analysis.

NOTE: Refer to Table 12 for summary data on Hamilton Field residents that will commute off-site.

TABLE 3.1.3-28

POPULATION, LABOR FORCE, AND HOUSEHOLD IMPACTS:
COMPARISON OF ALTERNATIVE #2 WITH PROPOSED PROJECT

Growth Created by Alternative #2

	Novato	South Marin County	Sonoma County
Residential Location of Project Workers	1,690	1,250	2,390
Population Growth	5,700	1,990	4,550
Household Formation	2,520	890	1,880
Labor Force Increase	3,540	1,290	2,470

Growth Created by Proposed Project

	Novato	South Marin County	Sonoma County
Residential Location of Project Workers	2,050	1,300	2,630
Population Growth	9,080	2,080	5,010
Household Formation	4,120	980	2,070
Labor Force Increase	5,640	1,350	2,720

Difference Between Alternative #2 and Proposed Project

	Novato	South Marin County	Sonoma County
Residential Location of Project Workers	-360	-50	-240
Population Growth	-3,380	-180	-460
Household Formation	-1,600	-90	-190
Labor Force Increase	-2,100	-60	-250

Source: Applied Development Economics

Housing Supply and Demand

Alternative 2 proposes to build 2,000 new housing units on the project site, or 1,550 housing units less than would be built under the proposed project. Project workers would occupy 830 units leaving an additional supply of 1,170 housing units at the project site for individuals and families in the regional labor force.

The jobs created by Alternative 2 will lead to an extra demand for 520 housing units in the rest of Novato (outside of the project area), even though there will be 2,000 new housing units built at the project site. This is slightly less than the 570 housing units in the rest of Novato that will be demanded by the proposed project. The expanded number of jobs at the project site will also increase the demand for housing in neighboring counties, although the demand will be less than under the proposed project. Approximately 240 less households will be formed in Sonoma County under Alternative 2 than under the proposed project. Approximately 90 less households will be formed in South Marin County under Alternative 2 than under the proposed project.

In summary, Alternative 2 will result in an expansion of 1,170 additional housing units in Novato that are not being occupied by project workers. Approximately 520 housing units in Novato located off the project site will be demanded by project workers. Approximately 890 housing units will be demanded by project workers in South Marin County, and 1,880 units will be demanded in Sonoma County.

Housing Affordability

Alternative 2 would reduce the number of housing units by 1,500 in comparison with the proposed project, thus reducing the supply of affordable housing in Novato. The project sponsor also indicates that the reduced over all density of development for this alternative will make housing subsidies for the BMR units more difficult, necessitating increased public subsidies. At the same time, however, Alternative 2 decreases the number of workers needing housing in each of the sub-regional housing markets, particularly in Marin and Sonoma Counties, reducing the upward pressure on housing prices. Overall, in relation to the proposed project, this alternative would have an adverse impact on housing affordability in Novato, but perhaps a neutral impact on regional housing affordability.

Jobs/Household Balance

Alternative 2 will generate 6,560 new jobs, and build 2,000 new housing units at the project site. Thus, Alternative 2 will create 3.3 jobs for every household formed on the project site, compared to 2 jobs for every household formed by the proposed project.

Accordingly, Alternative 2 would shift Novato's jobs/household balance from 1.29:1 with no Hamilton project to 1.44:1 by the year 2000. In comparison, the proposed project would shift Novato's jobs/household balance to 1.38:1 by the year 2000. Alternative 2 would barely shift Marin County's jobs/housing balance from 1.15 jobs per household with no Hamilton project to 1.19 jobs per household. In comparison, the proposed project would shift Marin County's projections for the year 2000 to 1.18 jobs per household.

ALTERNATIVE 3: INCREASED HOUSING, DECREASED JOBS

Job Growth

Project Alternative 3 proposes to build 1.92 million square feet of office, industrial, and commercial space between 1990 and 2000. Full utilization of the space will accommodate 4,800 employees, of which 4,670 would be in new jobs (130 jobs will be moved from the existing Sutter Hospital).

Table 3.1.3-29 shows that Alternative 3 would result in the creation of 2,500 less direct jobs, and 4,940 less secondary jobs than would be created by the proposed project. In total, Alternative 3 would create 7,440 less jobs than the proposed project.

The adoption of Alternative 3 would result in 3,000 less direct and indirect jobs in Novato than would be created by the proposed project. Alternative 3 would also create 2,730 less secondary jobs in South Marin County and 1,470 less secondary jobs in Sonoma County than would be created by the proposed project.

Table 3.1.3-30 shows the breakdown of employment by industry and occupation for the direct jobs created by Alternative 3, and compares the employment distribution to the proposed project. Alternative 3 is much smaller than the proposed project, and it eliminates the medical research component of the project and reduces the program for nearly all the other land uses except the office space. The adoption of Alternative 3 would

TABLE 3.1.3-29

TOTAL EMPLOYMENT CREATED BY ALTERNATIVE #3
COMPARED TO PROPOSED PROJECT

	Alternative #3	Proposed Project	Change
Direct Jobs	4,670	7,170	-2,500
Total Secondary Jobs (Estimated)	9,230	14,170	-4,940
Estimated Secondary Jobs (Located in Novato)	1,110	1,610	-500
Estimated Secondary Jobs (Located in Marin County)	5,170	7,900	-2,730
Estimated Secondary Jobs (Located in Sonoma County)	2,710	4,180	-1,470
Total Jobs (Estimated)	13,900	21,340	-7,440

Source: Applied Development Economics

TABLE 3.1.3-30

EMPLOYMENT DISTRIBUTION OF ALTERNATIVE #3
COMPARED TO PROPOSED PROJECT

LAND USE	Alternative #3	Proposed Project	Change	OCCUPATION	Alternative #3	Proposed Project	Change
Office	2,560	2,560	0	Professional, Managerial, Technical	1,810	2,600	-790
Medical Research	0	840	-840				
Other Research	560	570	-10	Clerical, Administrative, Sales	2,040	2,570	-530
Industrial	350	700	-350				
Warehousing	200	390	-190	Production	510	1,010	-500
Retail	270	450	-180	Other	440	1,120	-680
Hotel	40	160	-120				
Hospital	320	320	0				
Nursing/Treatment	140	860	-720				
Medical Offices	220	210	10				
Project Wide	150	230	-80				
TOTALS	4,810	7,290	-2,480		4,800	7,300	-2,500

Source: Applied Development Economics

lead to a drop of 840 jobs in medical research, 720 jobs in nursing/treatment care, 350 industrial jobs, 190 warehousing jobs, 180 retail jobs, and 120 hotel jobs, as compared to the proposed project.

The changes proposed for Alternative 3 would decrease employment in all occupational categories. Approximately 790 less jobs would be created in the professional, managerial, and technical occupations, 680 less jobs in other occupations, 530 less jobs in clerical, administrative, and sales occupations, and 500 less jobs in production occupations.

Workforce Commute Patterns

Alternative 3 decreases the number of workers, but increases the number of housing units onsite by 200. The result is that a higher percentage of the workers would live onsite and fewer would live in South Marin communities. Table 3.1.3-31 compares the commuting patterns of Hamilton Field workers under Alternative 3 with the commuting patterns that would be established under the proposed project. Approximately 3,640 workers will commute each day into Hamilton Field under Alternative 3 compared to the proposed project's 5,250 commuting workers. Under Alternative 3 there will be approximately 900 less commuters traveling to Hamilton Field from Sonoma County, and approximately 470 less commuters traveling from South Marin County. The greater amount of housing being built under Alternative 3 means that there would be approximately 4,180 residents commuting to work off-site, compared to the 3,500 residents commuting off-site under the proposed project.

Population, Labor Force, and Household Growth Patterns

Table 3.1.3-32 shows that Alternative 3 will increase Novato's permanent resident population by 8,980 persons. Novato's new residents would form 4,120 new households, and approximately 5,580 of the new residents would join the labor force. The difference in population and household impacts on Novato between project Alternative 3 and the proposed project is very small. The adoption of Alternative 2 rather than the proposed project would result in only 100 less residents and no change in households formation.

The adoption of Alternative 3 would also impact the population base of Sonoma and South Marin Counties and expand the household formation in each jurisdiction. However, the

TABLE 3.1.3-3'

RESIDENTIAL LOCATION OF PROJECT WORKFORCE
COMPARISON OF ALTERNATIVE #3 WITH PROPOSED PROJECT

LOCATION	% Distribution	Alternative #3	% Distribution	Proposed Project	Change
On-site Housing	18.7%	900	16.8%	1,230	-330
COMMUTING TO HAMILTON FIELD FROM: Other Novato	11.5%	550	11.3%	820	-270
South Marin County	15.8%	760	17.8%	1,230	-470
San Francisco	8.0%	380	8.0%	570	-190
Sonoma County	36.4%	1,730	36.0%	2,630	-900
Napa County/Vallejo	5.4%	240	5.0%	360	-120
East Bay/Other	5.4%	240	5.0%	360	-120
SUBTOTAL: COMMUTING TO HAMILTON FIELD FROM OUT OF NOVATO		3,640		5,250	-1,610
SUBTOTAL: LIVING AT HAMILTON FIELD BUT COMMUTING OFF-SITE		4,180		3,500	680

Source: Applied Development Economics based on data from employer survey and housing affordability analysis.

NOTE: Refer to Table 12 for summary data on Hamilton Field residents who will commute off-site.

TABLE 3.1.3-32

POPULATION, LABOR FORCE, AND HOUSEHOLD IMPACTS:
COMPARISON OF ALTERNATIVE #3 WITH PROPOSED PROJECT

Growth Created by Alternative #3

	Novato	South Marin County	Sonoma County
Residential Location of Project Workers	1,450	760	1,730
Population Growth	8,980	1,210	3,290
Household Formation	4,120	540	1,360
Labor Force Increase	5,580	780	1,790

Growth Created by Proposed Project

	Novato	South Marin County	Sonoma County
Residential Location of Project Workers	2,050	1,300	2,630
Population Growth	9,080	2,080	5,010
Household Formation	4,120	980	2,070
Labor Force Increase	5,640	1,350	2,720

Difference Between Alternative #1 and Proposed Project

	Novato	South Marin County	Sonoma County
Residential Location of Project Workers	-600	-540	-900
Population Growth	-100	-870	-1,720
Household Formation	0	-440	-710
Labor Force Increase	-60	-570	-930

Source: Applied Development Economics

decline in jobs proposed for Alternative 3 would result in less impacts on South Marin County and Sonoma County than under the proposed project. The adoption of Alternative 3 would lead to 710 less households in Sonoma County, and 440 less households formed in South Marin County. Population and labor force impacts would also decline proportionately.

Housing Supply and Demand

Alternative 3 proposes to build 3,750 new housing units on the project site which is 200 more housing units than would be built under the proposed project. Project workers would occupy 610 units leaving an additional supply of 3,140 housing units at the project site for individuals and families in the regional labor force.

The jobs created by Alternative 3 will lead to an extra demand for 370 housing units in the rest of Novato (outside of the project area), even though there will be 3,750 new housing units built at the project site. Thus, Alternative 3 would create less demand on Novato's existing housing stock than would the proposed project.

The adoption of Alternative 3 would lead to less demand for housing in neighboring counties than would be the case under the proposed project. Approximately 710 less households would be formed in Sonoma County under Alternative 3 than under the proposed project. Approximately 440 less households will be formed in South Marin County under Alternative 3 than under the proposed project.

In summary, Alternative 3 would result in an expansion of 2,940 additional housing units in Novato that are not being occupied by project workers. Approximately 370 housing units located off the project site in Novato will be demanded by project workers. Approximately 540 housing units will be demanded by project workers in South Marin County, and 1,360 units will be demanded in Sonoma County.

Housing Affordability

Alternative 3 would increase the number of rental units by 200 in comparison with the proposed project which would create a marginally more positive impact on housing affordability in Novato. At the same time, Alternative 3 decreases the number of jobs on

site, which reduces further pressure on regional housing markets, particularly in Marin and Sonoma Counties. Overall, in relation to the proposed project, Alternative 3 would have a positive impact on housing affordability.

Jobs/Household Balance

Alternative 3 will generate 4,800 new jobs, and build 3,750 new housing units at the project site. Thus, Alternative 3 would create 1.3 jobs for every household formed on the project site, compared to 2 jobs for every household formed by the proposed project.

Alternative 3 has no impact on Novato and Marin County's jobs/household balance since Alternative 3 closely resembles the existing jobs/household balance of each jurisdiction. The adoption of Alternative 3 would keep Novato's jobs/household balance at 1.29:1 through the year 2000. Marin County's jobs/household balance would shift from 1.15 jobs per household to 1.14 jobs per household by 2000.

MITIGATION MEASURES

PROPOSED PROJECT

Job Growth

The project sponsor should work with the City of Novato and appropriate special districts to ensure that an adequate supply of public services needed to support the job growth can be provided. Specifically, the City and project sponsor need to agree upon strategies to finance fire, police, and educational services on the site. The project sponsor should also prepare a water conservation plan, establish an onsite recycling and resource recovery program, and work with the Sanitation District to ensure that the sewage treatment plant is expanded in proportion to the scale of development. Finally, the project sponsor should also work with the Marin County Private Industry Council and the California Employment Development Department to assist local residents to be trained and placed in jobs at the project site. There are no changes in the recommended mitigations for each alternative.

Expansion of Housing Supply

The project sponsor should work with the City of Novato and appropriate special districts to ensure that an adequate supply of public services needed to support the new housing

can be provided. Specifically, a plan needs to be prepared to finance the expansion of school and library services for new residents. An expansion of Novato's recreational services will also be needed. There are no changes in the recommended mitigations for each alternative.

Commuting and Traffic Congestion

Project sponsor should work with the State, County, and City to upgrade the highway system for commuters, and seek to start up alternative transportation over the long run. Project sponsor should promote ride sharing and car pooling in order to ease traffic congestion. Project sponsor should build a proportionate share of housing to keep housing production in balance with job growth in order to assure there will be adequate housing for project workers, and to reduce the need to commute during the construction phase of the project. Project sponsor should work with businesses onsite to ensure that project workers are notified of the availability of housing onsite. Project sponsor should incorporate right of first refusal and second priority housing.

Population Growth and New Household Formation

The only available mitigation for impacts created by new population and household growth is to ensure that an adequate supply of public services can be provided. The project sponsor should work with all local governments and special districts to plan for the expansion of public services on the same scale of growth planned for the proposed project. There are no changes in the recommended mitigations for each alternative.

Housing Affordability

It is recommended by the Redevelopment Agency that the project sponsors be required to provide the 350 BMR units for affordability for a minimum of 30 years. The redevelopment agency's 20% housing set aside could also be used to leverage a provision of low or very low income household affordability within the redevelopment project area, whether or not those households have an employee at Hamilton. The intent here is to spread around the provision for low/very low income households within the City.

ALTERNATIVE 1: DECREASED HOUSING, INCREASED JOBS

ALTERNATIVE 2: DECREASED HOUSING, DECREASED JOBS

ALTERNATIVE 3: INCREASED HOUSING, DECREASED JOBS

Mitigation for the proposed project would apply equally to Alternatives 1, 2 and 3.

¹ ABAG projects that there will be 1.4 jobs per household in the San Francisco Metropolitan Area through the rest of the century. The household survey of Bay Area residents conducted by Applied Development Economics corroborates the ABAG projections as ADE found that in 1986 there were 1.4 jobs per household among the more than 250 households surveyed.

² Data from the Northern California Real Estate Report; Real Estate Research Council of Northern California, April 1987.

³ ABAG Projections 87.

⁴ Data from the Northern California Real Estate Report; op. cit.

⁵ City of Novato Housing Element, July 1984. Prepared by Duncan & Jones.

⁶ In the 1980 Census the mean annual income of renters was 50% that of all households. Assuming that these relationships hold constant in 1988 we can estimate the mean annual income of today's renters.

⁷ It is possible that other existing Marin County firms will relocate to Hamilton; however, such relocations have not been subtracted from the project employment total because reuse of the existing business' locations by other firms would counteract the reduction in project impacts. If firms relocate to Hamilton and their existing space is not reused, then the overall employment impact of the project would be lower than stated in this section.

⁸ The development of 3,550 new housing units will create a population increase of 7,600 persons at Hamilton Field assuming the household sizes:

studios and senior units	1.2persons/household
apartments	2.39persons/household
for sale units	2.59persons/household

In addition, the new jobs at Hamilton Field will attract 830 workers who will look for an additional 570 housing units in Novato, resulting in the total formation of 4,120 new households in Novato. The new workers living off-site will bring with them family members increasing Novato's population by an additional 1,470 persons who will not live on the project site.

⁹ Since 1970 the rental housing supply in Novato has remained at 40% of the total housing supply. Assuming that 40% of the new housing that is projected by ABAG will be rental, the development of the project will change the rental mix in Novato. The project will build 2,698 units beyond that projected by ABAG between 1990 and 2000. The construction of 89% rental housing at the project will change the rental mix from 40 to 45% of Novato's total housing units.

SUMMARY COMPARISON OF IMPACTS AND MITIGATION MEASURES

3.1.3 POPULATION, EMPLOYMENT, AND HOUSING

1. JOB GROWTH	IMPACT	MITIGATION
PROPOSED PROJECT	The proposed project would build out 2.9 million square feet of business space which will lead to the formation of 7,170 new jobs, and an additional 14,170 secondary jobs. New business formation will require the City of Novato to pay for and provide a variety of new support services such as additional fire services, police services, and an expanded solid waste disposal system, the construction of a new storm drainage system, and the expansion of the sewage treatment system.	The project sponsor should work with the City of Novato and appropriate special districts to ensure that an adequate supply of public services needed to support the job growth can be provided. The project sponsor should also work with the Marin County Private Industry Council and the California Employment Development Department to assist local residents to be trained and placed in jobs at the project site.
ALTERNATIVE 1: (Decreased Housing, Increased Jobs)	Project Alternative #1 would build out 3.5 million square feet of business space which will lead to the formation of 7,760 new jobs, and an additional 15,740 secondary jobs. This represents a 20% increase in space constructed for office and industry beyond the proposed project. New business formation would require the City to provide services described above.	Mitigation would be the same as for the proposed project.
ALTERNATIVE 2: (Decreased Housing, Decreased Jobs)	Project Alternative #2 would build out 2.87 million square feet of business space which will lead to the formation of 6,430 new jobs, and 12,850 secondary jobs. The scale of business development proposed in Alternative #2 closely resembles that of the proposed project. The City would need to provide appropriate services described above.	Mitigation would be the same as for the proposed project.
ALTERNATIVE 3: (Increased Housing, Decreased Jobs)	Project Alternative #3 would build out 1.92 million square feet of new business space, which would lead to the formation of 4,670 new jobs, and 9,230 secondary jobs. This is a 34% percent reduction of the scale of the proposed project. Yet the City of Novato would still be required to provide adequate support services.	Mitigation would be the same as for the proposed project.

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SUMMARY COMPARISON OF IMPACTS AND MITIGATION MEASURES

3.1.3 POPULATION, EMPLOYMENT, AND HOUSING

2. COMMUTING	IMPACT	MITIGATION
PROPOSED PROJECT	The Proposed project would create a total of 9,200 additional commuters who use Highway 101 each day. Approximately 5,260 workers would commute to Hamilton Field from either southern Marin or Sonoma Counties. Approximately 3,940 project residents would commute out of Hamilton Field to work elsewhere in the San Francisco Metropolitan Area.	The project sponsor should work with the State, County, and City to upgrade the highway system for commuters, and seek to start up alternative transportation over the long run. The project sponsor should promote ride sharing and car pooling in order to ease traffic congestion. The project sponsor should build a proportionate share of housing to keep housing production in balance with job growth in order to assure there will be adequate housing for project workers, and to reduce the need to commute during the construction phase of the project. The project sponsor should work with business onsite to ensure that project workers are notified of the availability of housing onsite. Project sponsor should incorporate right of first refusal and second priority housing.
ALTERNATIVE 1: (Decreased Housing, Increased Jobs)	Alternative #1 would create 9,280 additional commuters who use Highway 101 each day, making the commuting impacts of Alternative #1 similar to the impacts from the proposed project. Approximately 5,680 workers would commute to Hamilton Field from southern Marin or Sonoma Counties. Approximately 3,600 project residents would commute out of Hamilton Field to work elsewhere in the San Francisco Metropolitan Area.	Mitigation would be the same as for the proposed project.
ALTERNATIVE 2: (Decreased Housing, Decreased Jobs)	Alternative #2 would create 6,955 additional commuters who use Highway 101 each day. This is a 24% decrease in the number of commuters created by the proposed project. Approximately 4,790 workers would commute to Hamilton Field from southern Marin or Sonoma Counties. Approximately 2,215 project residents would commute out of Hamilton Field to work elsewhere in the San Francisco Metropolitan Area.	Mitigation would be the same as for the proposed project.
ALTERNATIVE 3: (Increased Housing, Decreased Jobs)	Alternative #3 would create 7,750 additional commuters who use Highway 101 each day. This is a 16% decrease in the number of commuters created by the proposed project. Approximately 3,600 workers would commute to Hamilton Field from southern Marin or Sonoma Counties. Approximately 4,150 project residents would commute out of Hamilton Field to work elsewhere in the San Francisco Metropolitan Area.	Mitigation would be the same as for the proposed project.

Note: For additional details regarding traffic, see section 3.1.4, Traffic and Transportation.

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SUMMARY COMPARISON OF IMPACTS AND MITIGATION MEASURES

3.1.3 POPULATION, EMPLOYMENT, AND HOUSING

3. GROWTH OF DWELLING UNITS	IMPACT	MITIGATION
PROPOSED PROJECT	The proposed project would build 3,550 new housing units and require that the City build an additional school, plan for the increased usage of existing schools, expand parks and recreation services, and build an additional library. The construction of the new housing combined with the construction of space for office and industry also contribute to the need for the City to expand additional services such as fire, police, solid waste, storm drainage, and sewer.	The project sponsor should work with the City of Novato and appropriate special districts to ensure that an adequate supply of public services needed to support the new housing can be provided.
ALTERNATIVE 1: (Decreased Housing, Increased Jobs)	Alternative #1 would construct 3,250 new housing units, closely resembling the scale of construction for the proposed project. The City would need to provide the same level of services as described above with the proposed project.	Mitigation would be the same as for the proposed project.
ALTERNATIVE 2: (Decreased Housing, Decreased Jobs)	Alternative #2 would substantially reduce the scale of new housing construction to 2,000 units. This alternative would put less pressure on the school system to increase usage. However, all other services described above will still need to be provided.	Mitigation would be the same as for the proposed project.
ALTERNATIVE 3: (Increased Housing, Decreased Jobs)	Alternative #3 would increase the number of new housing units built to 3,750. The City should provide the same level of services as described above.	Mitigation would be the same as for the proposed project.

SUMMARY COMPARISON OF IMPACTS AND MITIGATION MEASURES

3.1.3 POPULATION, EMPLOYMENT, AND HOUSING

4. POPULATION INCREASE & HOUSEHOLD FORMATION	IMPACT	MITIGATION
PROPOSED PROJECT	The proposed project would lead to the formation of 4,120 new households in Novato which exceeds the number of housing units built onsite by 570. Project would also lead to the formation of 880 new households in south Marin and 2,070 new households in Sonoma Counties. An expanded population would increase the pressure to provide affordable housing, and expand the demand for services.	The only available mitigation for these impacts is to reduce the project size. The project sponsor should work with the City of Novato and appropriate special districts to ensure that an adequate supply of public services needed to support the new housing can be provided.
ALTERNATIVE 1: (Decreased Housing, Increased Jobs)	Alternative #1 would lead to the formation of 3,880 households in Novato, exceeding number of housing units built onsite by 630 units. Alternative #1 would lead to the formation of 1,060 households in south Marin and 2,290 households in Sonoma Counties.	Mitigation would be the same as for the proposed project.
ALTERNATIVE 2: (Decreased Housing, Decreased Jobs)	Alternative #2 would lead to the formation of 2,520 households in Novato, and would exceed the number of housing units built onsite by 520 units. Alternative #2 would lead to the formation of 890 households in south Marin and 1,880 households in Sonoma Counties.	Mitigation would be the same as for the proposed project.
ALTERNATIVE 3: (Increased Housing, Decreased Jobs)	Alternative #3 would lead to the formation of 4,120 households in Novato, and would exceed the number of housing units built onsite by 370 units. Alternative #3 would lead to the formation of 540 households in south Marin and 1,360 households in Sonoma Counties.	Mitigation would be the same as for the proposed project.

SUMMARY COMPARISON OF IMPACTS AND MITIGATION MEASURES

3.1.3 POPULATION, EMPLOYMENT, AND HOUSING

5. HOUSING AFFORDABILITY	IMPACT	MITIGATION
PROPOSED PROJECT	The project would lead to a need for 570 more housing units in Novato than would be built at Hamilton Field, creating a net demand for additional housing, and driving Novato's market value housing prices upward. The set aside of 355 below market rate housing units would help keep prices down. The formation of 880 households in south Marin and 2,070 households in Sonoma Counties would also create additional demand for housing and incrementally drive market prices up in each jurisdiction.	The City should set aside 20% of the redevelopment revenue to implement the BMR program. The commitment for BMR should be extended from 20 to 30 years.
ALTERNATIVE 1: (Decreased Housing, Increased Jobs)	Alternative #1 would lead to a need for 630 more housing units in Novato than would be built at Hamilton Field, and create upward pressures on Novato's housing prices, even with the construction of 325 BMR units. Alternative #1 would also lead to the formation of 1,060 new households in south Marin, and 2,290 households in Sonoma Counties, and create upward pressure on housing prices in each jurisdiction.	Mitigation would be the same as for the proposed project.
ALTERNATIVE 2: (Decreased Housing, Decreased Jobs)	Alternative #2 would lead to a need for 522 more housing units in Novato than would be built at Hamilton Field, and create upward pressures on Novato's housing prices, even with the construction of 200 BMR units. Alternative #2 would also lead to the formation of 890 new households in south Marin, and 1,880 households in Sonoma Counties, and create upward pressure on housing prices in each jurisdiction.	Mitigation would be the same as for the proposed project.
ALTERNATIVE 3: (Increased Housing, Decreased Jobs)	Alternative #3 would lead to a need for 370 more housing units in Novato than would be built at Hamilton Field which will create upward pressures on Novato's housing prices, even with the construction of 375 BMR units. Alternative #3 would also lead to the formation of 540 new households in south Marin, and 1,360 households in Sonoma Counties, and create upward pressure on housing prices in each jurisdiction.	Mitigation would be the same as for the proposed project.

SUMMARY COMPARISON OF IMPACTS AND MITIGATION MEASURES

3.1.3 POPULATION, EMPLOYMENT, AND HOUSING

6. JOB / HOUSING BALANCE	IMPACT	MITIGATION
PROPOSED PROJECT	The proposed project would produce more than twice as many jobs as housing units in Novato, it would shift the City's jobs / housing balance more closely toward the regional average, and shift Sonoma County's jobs / housing balance away from the regional average by stimulating the formation of new households.	Further imbalance in Sonoma County's jobs / housing balance can only be corrected by encouraging the creation of new jobs in Sonoma County. New job production in Novato will always create pressure on Sonoma County's housing market as long as Novato workers choose to seek housing in Sonoma County.
ALTERNATIVE 1: (Decreased Housing, Increased Jobs)	Alternative #1 would create 2.5 times as many jobs as housing units in Novato, move Novato's jobs / housing balance more closely toward the regional average than the proposed project, and move Sonoma County's jobs / housing balance further away from the regional average than the proposed project.	Mitigation would be the same as for the proposed project.
ALTERNATIVE 2: (Decreased Housing, Decreased Jobs)	Alternative #2 decreases both jobs and housing, but 3.2 times as many jobs would be created as housing units built. It will shift Novato's jobs / housing balance more closely toward the regional average than the proposed project, and shift Sonoma County's jobs / housing balance away from the regional average.	Mitigation would be the same as for the proposed project.
ALTERNATIVE 3: (Increased Housing, Decreased Jobs)	Alternative #3 would create only 1.2 times as many jobs as housing units, moving Novato's jobs / housing balance more closely toward the regional average, and moving Sonoma County's jobs / housing balance away from the regional average.	Mitigation would be the same as for the proposed project.

3.1.4 TRAFFIC AND TRANSPORTATION

INTRODUCTION

Traffic congestion in Marin and Sonoma counties has reached proportions where existing congestion as well as potential increases in congestion due to land development have become a major concern of the State and the residents of these counties. The Highway 101 corridor in Marin and Sonoma counties is currently being studied by a number of agencies and consultants. Potential solutions to these problems are being explored in terms of both capacity improvements and funding solutions for the improvements. The status of these studies and planning efforts in Marin and Sonoma counties are of critical importance to this study since the proposed project would have regional impacts. The context of this study and the potential corridor projects and the current planning status of the projects are briefly discussed below.

The traffic circulation element of this document was preceded by a number of traffic planning studies and by a previous EIR for a similar, but larger, project at Hamilton Field. The previous proposal to develop this property would have resulted in 2,680 PM peak hour trips on northbound Highway 101 to the north of the Ignacio Boulevard interchange. The magnitude of these impacts led to a rethinking of the project. The current proposal would reduce this key impact to a total of 1700 PM peak hour trips on this segment of Highway 101, without the transitway or the planned TSM program. This reduction was accomplished by scaling back the employment generating land uses by about 35% and by improving the jobs-housing balance.

While this project represents a scaled down version of the previous proposal, it was recognized that a number of local improvements and highway interchange and mainline improvements would be needed to accommodate the traffic generated by the project. In order to assure that feasible, project sponsored, roadway improvements could be developed, this study was preceded by an analysis of numerous alternatives, including new highway 101 ramps, upgrading of existing ramps, and improvements to the Highway 101/ State Route 37 interchange. The need for CalTrans involvement was also recognized; accordingly, a traffic study was prepared as input to a CalTrans Project Study Report (PSR), which is the first step required to implement freeway improvements. The PSR is currently being prepared by Caltrans with input from the City of Novato and its consultants, but at the time of this writing, the PSR has not been finalized.

There are four major elements involved in the CalTrans "Project Development Process". These are environmental, right-of-way acquisition, design, and construction. The City and CalTrans are presently involved in the initial phase of the environmental process. This initial stage is primarily oriented at "project definition". Since State Routes 101 and 37 are federal aid primary routes, both FHWA and CalTrans have jurisdiction over the project. Hence, all State and federal policies and requirements are applicable.

The City of Novato is providing significant assistance to CalTrans through the use of consultants. At the present, the City is currently assisting CalTrans in evaluating the need for improvements within the Study area and a range of alternatives through the preparation of a Project Study Report (PSR). PSR's are primarily internal CalTrans documents which evaluate alternative geometrics, estimate costs, and identify any potential environmental impacts of the project that affect the viability of alternatives to be further evaluated in a subsequent environmental process.

In the course of developing input to the PSR, the consultant team identified roadway improvements, some of which would provide improved access/circulation to and within the City of Novato. Conceptual geometrics were developed for the following interchanges:

- o 101/37 freeway-to-freeway interchange;
- o Alameda del Prado/101 interchange, and
- o Ignacio/101 interchange.

Alternatives were also developed for the modification of both the Alameda del Prado and Ignacio interchanges. These alternatives include a combination of new ramps, dedicated turn lanes, and signal improvements. CalTrans District 4 is in the process of reviewing the geometrics.

On State or special tax funded projects, CalTrans would start the detail environmental review process upon approval of the PSR. This is the stage where CalTrans conducts public meetings and public hearings. Since there are presently no State funds committed to these improvements, the environmental review process would not be initiated until the City has secured a source of funds for subsequent project development work and the appropriate level of improvements.

The traffic study which was prepared as input to the PSR is contained in Technical Appendix C.

The types of improvements along the Highway 101 corridor which are currently being studied include:

- o Widening Highway 101;
- o Constructing a transitway (bus or rail) along the NWPRR right-of-way;
- o Building an arterial along the east side of Highway 101.

The role of the Highway 101 Corridor Committee includes an evaluation of all three of the above improvements. A number of alternatives have been developed around these improvements, but a single preferred alternative has not as yet been selected. A large portion of the funding for these improvements hinges on the passing of a 1/2 cent sales tax which is to be placed before Marin County Voters. If this sales tax measure passes, the corridor study indicates that only one of the major improvements could be funded by the sales tax. That is, either the transitway could be implemented or Highway 101 could be widened, but both could not be funded with the sales tax at this time. However, an additional one-half cent tax (one cent total) is under consideration and could be approved in the 1990 general election. This would allow for both highway and transitway improvements.

McInnis Parkway is identified in the San Rafael General Plan and is generally located on the County of Marin Activity Center Plan. A joint effort is now being made between Marin County, the City of Novato and the City of San Rafael to determine a possible alignment for this parkway. The PSR traffic study examined the impact of the McInnis Parkway with the proposed Hamilton Field project with cumulative traffic for years 1997 and 2010. This study showed that the parkway would significantly reduce traffic on Highway 101 and would improve operations on local streets near Hamilton Field.

Given that McInnis Parkway, and most of the Highway 101 improvements currently being studied, are at a preliminary planning stage and funding for these improvements is uncertain, these transportation improvements are not included in the assumptions for evaluating the project's traffic impacts. The transitway is considered in this EIR document, however, so that the assumptions are consistent with the 1986 Hamilton Field EIR, the Highway Corridor Study, and with projections for Highway 101 traffic by Sonoma

County. A treatment of parkway, transitway and freeway improvement scenarios can be found in the traffic study prepared by Caltrans as supplementary input to the PSR which is contained in the Technical Appendix C and discussed in the Mitigation chapter of this section.

SETTING

The existing transportation system in the Hamilton Field study area is discussed in this section. The study area is defined in Figure 3.1.4-1. The topics covered in this section include existing traffic flows on Highway 101, State Route 37, and local streets; the existing levels of service on highways and at roadway junctions; existing transit use and availability; and a statement of the transportation improvements which would be made in coordination with the proposed land development phasing at the Hamilton Field.

The discussion below is structured as follows:

1. Study Area Roadways - a description of the major traffic carrying streets and highways;
2. Existing Traffic Flows - a discussion of current flow levels and parking characteristics;
3. Level of Service Concept - a brief definition of the technical descriptions of roadway levels of service;
4. Existing Levels of Service - a discussion of current operating conditions at roadway junctions and freeway ramps, merges, and weaving sections;
5. Existing Transit Service - a summary of transit service which currently serves Hamilton Field;
6. Planned Roadway and Transit Improvements - a description of the roadway improvements planned by Caltrans and the City of Novato.

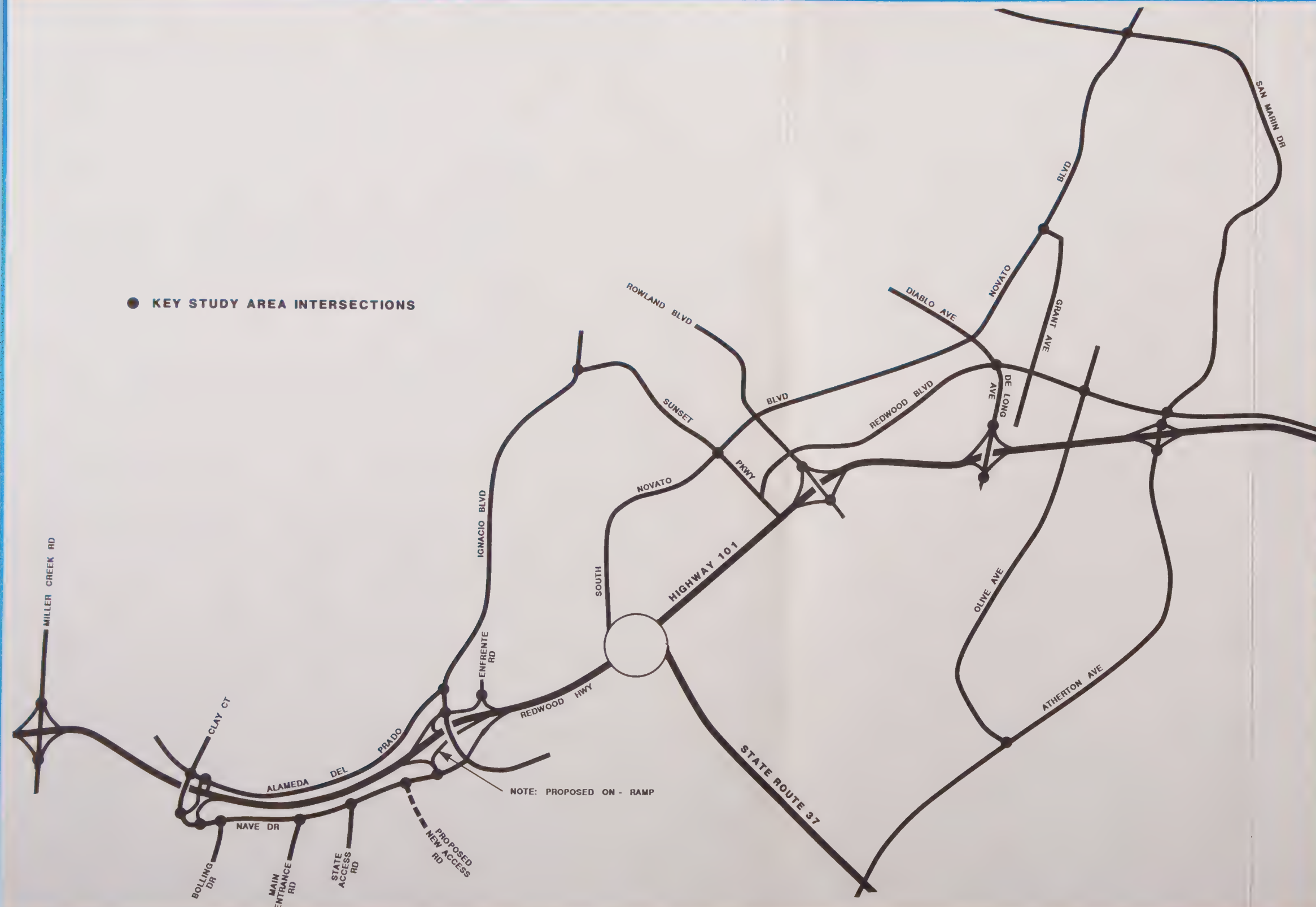
ROADWAY NETWORK

Highway 101

Regional access to Hamilton Field is provided by Highway 101. Two existing freeway interchanges connect Highway 101 to the local streets which feed into Hamilton Field. These two interchanges are located at Ignacio Boulevard and Alameda del Prado. The major roadways, Highway 101 and State Route 37, are described below.

HAMILTON FIELD MASTER PLAN EIR

FIGURE 3.1.4-1



KEY INTERSECTIONS IN THE STUDY AREA



NOT TO SCALE



SOURCE: WILBUR SMITH ASSOCIATES

To the north of the study area at the Sonoma County/Marin County border, Highway 101 is a four lane highway (two lanes in each direction). Moving south into Novato, it widens to six lanes. Thereafter, Highway 101 is six lanes wide up to the Marinwood (Miller Creek Road) interchange, plus auxiliary lanes on the segment between the Marinwood interchange and the Alameda del Prado interchange. The Highway 101/ State Route 37 interchange is a full freeway-to-freeway interchange with access to South Novato Boulevard. The speed limit on Highway 101 is 55 miles per hour; however, peak period speeds are often much lower. Travel speeds and levels of service are discussed later in this section.

State Route 37

This highway provides a link to the Napa and Sonoma Valleys. The highway is four lanes wide (two lanes in each direction) in the study area. The interchange with Highway 101 allows for movements in all directions, including a connection to South Novato Boulevard, which lies west of Highway 101. The speed limit on Highway 37 is 55 miles per hour and vehicles flow freely during the peak periods.

Nave Drive

This frontage road is a two-lane facility which widens near the Ignacio Boulevard interchange. The speed limit on this road is 35 miles per hour between Alameda del Prado up to a point 350 feet north of Bolling Drive. The speed limit increases to 40 miles per hour on the next segment up to a point 600 feet south of Roblar Drive where the speed limit drops back down to 35 miles per hour. All vehicular traffic with origins or destinations at Hamilton Field currently use Nave Drive. Both commercial and residential land uses are served by Nave Drive. Parking is prohibited along Nave Drive.

Alameda del Prado

Located on the west side of Highway 101, this two-lane frontage roadway serves as a connection between Ignacio Boulevard and the Alameda del Prado interchange. Near the Alameda del Prado interchange, a park-and-ride lot is available for commuters. Land uses along this roadway include both commercial and residential uses.

Ignacio Boulevard

This roadway is a 35 mile-per-hour, four-lane arterial which provides access to points west of Highway 101. Class II bike lanes are provided along each side of the roadway, which is divided by a raised median. Parking is permitted on both sides and left turn bays are provided at most intersections. The majority of the intersections are controlled by stop signs on the minor street. Exceptions to this occur at the intersection with Sunset Parkway, which is controlled by a four-way stop, and at the Highway 101 interchange, where traffic is controlled by traffic signals. Near Highway 101, most land uses are commercial. Further to the west, residential units dominate.

Main Gate Road and State Access Road

These two roadways provide the current access for the proposed development. Both are two-lane roadways (one lane in each direction) with 25 mile-per-hour speed limits. Egress from each to Nave Drive is controlled by a stop sign. A new main entrance road to the site is proposed, as discussed later in this section.

South Novato Boulevard

This roadway is a two to three-lane arterial which runs parallel to Highway 101 between DeLong Avenue and a point to the south where it angles to the east. After turning east, it intersects Highway 101 at the State Route 37 junction. North of DeLong Avenue, South Novato Boulevard veers to the west. The speed limit on South Novato Boulevard is 35 mph south of Rowland, and 30 mph from Rowland Boulevard to Diablo. North of Diablo the speed limit increases to 35 mph, and to 40 mph northwest of Seventh Street. Parking is permitted along most of its length.

San Marin Drive

This east-west street runs from Highway 101 at the Atherton interchange in the east to its intersection with South Novato Boulevard in the west. From Novato Boulevard to Simmons Lane it is four lanes wide with a planted median; east of Simmons Lane it is two lanes plus a bike lane. The speed limit along San Marin Drive is 35 mph west of Simmons Lane, 45 mph from Simmons Lane to Highway 101. Parking is permitted along most of its length. The land use along this street is primarily residential.

Grant Avenue

This street is a main street in downtown Novato. For most of its length, Grant Avenue is two lanes wide. Small retail shops line most of Grant Avenue. Parking is permitted on both sides, with angle parking in the Old Town area. The speed limit is 25 miles per hour on this street.

Redwood Drive

This street runs parallel to Highway 101 from San Marin Drive to Rowland Boulevard. The cross-section of Redwood Drive is four lanes along this entire length, with frontage roads on both sides between Olive Avenue and Grant Avenue. South of Rowland Boulevard it is a two-lane street serving a residential area. Parking is permitted on Redwood except on the Olive to Grant portion; on this segment angle parking and driveway access to businesses exist on the frontage road. The speed limit on Redwood Drive is 45 miles per hour, except for the portion near downtown where the speed limit is reduced to 25 mph.

Atherton Avenue

Atherton Avenue is a two lane rural County road with dirt and gravel shoulders. It connects Highway 101 with State Route 37. Parking is not permitted on this road. The speed limit is 45 miles per hour, and abutting land uses are primarily agricultural with some residential properties.

Olive Street

This County road begins near Redwood Drive on the west side of Highway 101 at a point north of the downtown area. It then runs under Highway 101 and intersects Atherton Avenue on the east side of Highway 101. Olive Street is two lanes wide. Parking is permitted. The speed limit is 40 miles per hour east of Rita Court, then 35 mph as far as the railroad tracks. West of the railroad tracks the speed limit is 25 mph.

DeLong Avenue

This street is the major connection between Highway 101 and the Downtown area of Novato. It is four lanes wide in the study area. Parking is permitted on segments near the downtown/City Hall area. The speed limit on this street is 25 mph. Land uses fronting DeLong Avenue consist primarily of public buildings and commercial uses.

Rowland Boulevard

Rowland Boulevard is four lanes wide in the study area, narrowing to two lanes west of South Novato Boulevard. It runs in an east-west direction, connecting Highway 101 to South Novato Boulevard. The Rowland Boulevard/Highway 101 interchange is of critical importance to this study as the proposed McInnis Parkway may terminate on the east side of Highway 101 at this interchange. The speed limit on this street is 35 mph east of South Novato Boulevard, and 25 mph west of South Novato Boulevard. Parking is permitted on both sides throughout.

Sunset Parkway

This parkway ties Ignacio Boulevard to central Novato. It is a two lane street with parking permitted. The speed limit on this street is 25 miles per hour. The primary land use along Sunset Parkway is residential.

Miller Creek Road

Miller Creek road is located to the south of Novato in the Marinwood area. This two-lane residential street intersects Highway 101. The speed limit on Miller Creek Road is 25 miles per hour. Parking is permitted along Miller Creek Road, except on the Highway 101 overpass.

Bel Marin Keys Boulevard

This four lane street provides the only access to the commercial and residential development in the Bel Marin Keys area. Near Highway 101 the speed limit on Bel Marin Keys is 25 miles per hour. Parking is permitted on this street.

TRAFFIC VOLUMES

Both morning and evening peak-period counts were conducted along Highway 101 at seven segments between San Rafael and Petaluma, at the 25 key intersections in the study area, and on the Highway 37 interchange ramps. All counts were undertaken while school was in session, on February 9-11 and 17-18, 1988. Recent traffic counts by CalTrans and previous traffic circulation studies were used to validate this data at locations where traffic data from CalTrans or other sources was available.

Estimated peak-hour flows and the time of the peak occurrence were determined. On Highway 101, the morning peak hour occurs between 7:00 A.M. and 8:00 A.M. and the evening peak hour occurs between 4:30 P.M. and 5:30 P.M. On local streets the peak hour was observed to occur slightly later during the morning (7:30 A.M. to 8:30 A.M.) and at the same time during the evening (the resulting peak hour volumes for Highway 101 and the local streets at key intersections in the study area are provided in Technical Background Document C). The current travel pattern is for heavy flows to the south during the morning peak hour and to the north during the evening peak hour. During both periods, peaking is spread out over more than two hours.

EXISTING LEVELS OF SERVICE

Traffic engineers commonly define the quality of traffic flow on a roadway by establishing its "Level of Service." Typically, intersections are bottlenecks on local roadways and the lane capacity, the merging capacity, or the weaving capacity is the limiting factor on a freeway. The level of service of each of these is measured with a slightly different approach, as discussed below.

Intersection Level of Service Concept

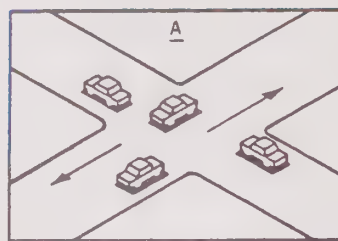
An intersection's level of service is a function of the ratio of the critical volume of traffic passing through an intersection to its capacity, or its volume-capacity ratio. Levels of service are designated with the letters, "A" through "F" to indicate the best to the worst traffic conditions, respectively. A range of volume-capacity ratios corresponding to each level of service designation is shown in Table 3.1.4-1. In this report, the methods set forth in the Transportation Research Board's (TRB) 1985 Highway Capacity Manual (planning method) were used to determine the critical volume and the theoretical capacity of an intersection.

Highway Level of Service Concept

Volume-capacity ratios may also be used to estimate the level of service on a freeway segment. However, travel speeds provide a more reliable indicator of levels of service under congested conditions since the volume of traffic passing a point on a highway segment over a given period of time will decline or be subject to unpredictable fluctuations once a certain threshold volume is reached. This breakdown occurs near

LEVEL OF SERVICE 'A'

- Volume/capacity ratio = 0 to 0.59
- Free flow conditions
- No vehicle waits longer than one signal indication

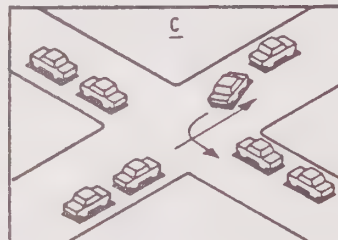


LEVEL OF SERVICE 'B'

- Volume/capacity ratio = 0.60 to 0.69
- Stable traffic flow
- Motorists rarely wait through more than one signal indication

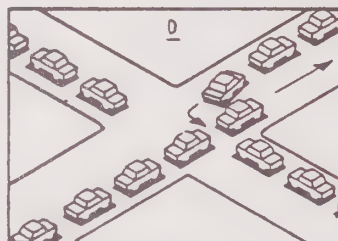
LEVEL OF SERVICE 'C'

- Volume/capacity ratio = 0.70 to 0.79
- Stable and acceptable flow but speed and maneuverability somewhat restricted due to higher volumes
- Motorists intermittently wait through more than one signal indication
Occasional backups behind left turning vehicles



LEVEL OF SERVICE 'D'

- Volume/capacity ratio = 0.80 to 0.89
- Extensive delays at times
- Some motorists, especially left turners, may wait through one or more signal indications, but enough cycles with lower demand occur to prevent excessive backups
- Maneuverability restricted

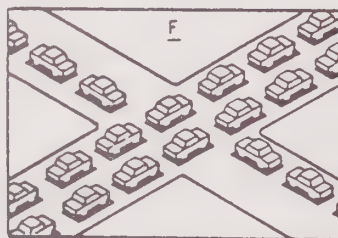


LEVEL OF SERVICE 'E'

- Volume/capacity ratio = 0.90 to 0.99
- Very long queues may create lengthy delays, especially for left turning vehicles
- Volume at or near capacity
- Unstable flow

LEVEL OF SERVICE 'F'

- Volume/capacity ratio = 1.00 or greater
- Backups from locations downstream restrict movement at intersection approaches
- Forced flow conditions
- Stoppage for long periods due to congestion
- Volumes drop to zero in extreme cases



HAMILTON FIELD MASTER PLAN EIR

LEVEL OF SERVICE DIAGRAM

2,000 vehicles per hour per lane under ideal conditions. Highway levels of service at various speeds are shown in Table 3.1.4-2. The maximum service flow (MSF) shown in this table represents traffic flow under ideal conditions; that is, with good weather, on level terrain, under daylight conditions.

The level of service was calculated at the key intersections in the study area. The resulting levels of service are shown in Table 3.1.4-3 for U.S. 101 Ramp intersections and Table 3.1.4-4 for surface street intersections. Peak hour levels of service on mainline sections of Highway 101 were also calculated and are shown in Table 3.1.4-5. Levels of service indicate the quality of the traffic flows; however, some characteristics of existing traffic conditions are not described by a level of service category. For this reason, the key roadways and highways are discussed in more detail.

Highway 101

This freeway currently experiences heavy congestion during peak hours in the major direction of travel. As shown in Table 3.1.4-5, traffic flow characteristics during the morning peak hour are different from those of the evening peak hour. Morning peak hour conditions are typically congested in the southbound direction as indicated by slow speeds (10 mph), low flow rates and low levels of service. The slow speeds are, at least in part, related to bottlenecks to the south on Highway 101. The lower flow rates during this peak hour are a result of constrained flow resulting from the bottlenecks to the south. Evening peak hour traffic conditions are congested in the northbound direction. In the northbound direction, some slowing occurs on the grade between Marinwood and Alameda del Prado. Until recently, a major bottleneck occurred at the Ignacio Boulevard interchange where the northbound on-ramp merges with Highway 101. A recently built auxiliary lane has remedied this problem. Flow rates increase north of Ignacio Boulevard and traffic flows smoothly up to the point where the third lane is dropped near the Sonoma County line. At this location some slowing occurs as drivers merge from the three lane section to the two lane section. During both peak periods in the off-peak travel direction, main line traffic operates at Level of Service A in the study area.

During the peak periods, traffic does not break down to stop-and-go conditions every day; however, these conditions do occur with sufficient frequency for congestion to be cited as a major transportation problem in Marin County. Congested freeway conditions impel

TABLE 3.1.4-2
HIGHWAY LEVELS OF SERVICE FOR VARIOUS
FREEWAY VOLUMES AND SPEEDS

<u>Speed¹</u>	<u>MSF²</u>	<u>Volume-Capacity Ratio</u>	<u>Level of Service</u>
--	--	--	A
> =50	1,000	0.49	B
> =47	1,400	0.69	C
> =42	1,700	0.84	D
> =30	2,000	1.00	E
< 30	- ³	- ³	F

¹ Average travel speed.

² Maximum Service Flow rate per lane in vehicles per hour, under ideal conditions.

³ Highly variable, unstable flow.

Source: TRB, Highway Capacity Manual, 1985.

Table 3.1.4-3

**EXISTING INTERSECTION LEVELS OF SERVICE
Highway 101 Ramps**

<u>Intersection</u>	<u>Morning Peak Hour</u>		<u>Evening Peak Hour</u>	
	<u>Volume- Capacity Ratio</u>	<u>Level of Service</u>	<u>Volume- Capacity Ratio</u>	<u>Level of Service</u>
Ignacio Blvd/Southbound Ramps	0.62	B	0.68	B
Enfrente Blvd./Southbound Off-ramp	0.53	A(1)	0.36	A
Ignacio Blvd/Northbound On-ramp (and Nave Drive)	0.76	C	0.96	E
Nave Drive/Northbound Ramps (Northern Ramps)	0.24	A	0.48	A
Alameda Del Prado/Southbound Ramps	0.56	A	0.31	A
Nave Drive/Northbound Ramps (Southern Ramps)	0.22	A	0.34	A
Miller Creek Rd./Northbound Ramps	0.15	A	0.43	A
Miller Creek Rd./Southbound Ramps	0.29	A	0.31	A
DeLong Ave./Southbound Ramps	0.66	B	0.48	A
DeLong Ave./Northbound Ramps	0.21	A	0.63	B
Rowland Blvd./Southbound Ramps	0.43	A	0.49	A
Rowland Blvd./Northbound Ramps	0.30	A	0.49	A

(1) Northbound left turn lanes were observed to have difficulty turning left against the high volume of southbound freeway off-ramp traffic

Source: Wilbur Smith Associates, May 24, 1988

Table 3.1.4-4

EXISTING INTERSECTION LEVELS OF SERVICE
SURFACE STREETS

<u>Intersection</u>	<u>Morning Peak Hour</u>		<u>Evening Peak Hour</u>	
	<u>Volume- Capacity Ratio</u>	<u>Level of Service</u>	<u>Volume- Capacity Ratio</u>	<u>Level of Service</u>
Ignacio Blvd./Sunset Pkwy.	0.31	A	0.37	A
Ignacio Blvd./Alameda del Prado	0.32	A	0.47	A
Alameda Del Prado/Clay Ct.	0.31	A	0.40	A
Olive Ave./Redwood Rd.	0.49	A	0.64	B
Atherton Ave/Olive Ave.	0.28	A	0.23	A
DeLong Ave./Redwood Rd.	0.34	A	0.54	A
S. Novato Blvd/Grant Ave.	0.32	A	0.46	A
S. Novato Blvd./San Marin Dr.	0.56	A	0.47	A
S. Novato Blvd./Sunset Pkwy.	0.55	A	0.66	B
Nave Dr./State Access Rd.	0.29	A	0.42	A
Nave Dr./Main Gate Rd.	0.22	A	0.39	A
Nave Dr./New Entrance Rd.	NA	NA	NA	NA
Nave Dr./Bolling Rd.	0.26	A	0.39	A

Source: Wilbur Smith Associates, May 24, 1988

Table 3.1.4-5

EXISTING PEAK HOUR FREEWAY OPERATIONS

Freeway Segment	PEAK DIRECTION LOS		PEAK DIRECTION FLOW		AVERAGE PEAK HOUR SPEEDS	
	AM Southbound	PM Northbound	AM Southbound	PM Northbound	AM Southbound (Miles per Hour)	PM Northbound
1. Highway 101						
o San Pedro Road	E	E	6,400	6,500	30 - 40	30 - 40
o South of Marinwood	E	E	5,400	6,600	40 - 50	40 - 50
o Marinwood to Alameda del Prado	E/F	E	5,200	6,400	30 - 40	30 - 40
o Alameda del Prado to Ignacio Blvd.	E	E	5,100	6,100	20 - 30	40 - 50
o Ignacio Blvd. to State Route 37	E	E	6,000	6,700	30 - 40	40 - 50
o State Route 37 to Rowland Blvd.	E	E	5,040	6,100	40 - 50	40 - 50
o Rowland Blvd. to DeLong Ave.	E	E	3,840	5,900	40 - 50	40 - 50
o DeLong Ave. to Atherton	E	E	3,550	4,650	40 - 50	40 - 50
o Marin/Sonoma County Line	E	E/F	3,400	3,600	40 - 50	20 - 40
2. State Route 37						
o East of Highway 37	A	B	1,200	1,100	40 - 50	40 - 50

Source: Wilbur Smith Associates, 1988.

commuters to use local streets as an alternative route. Infiltration results in lower levels of service on many local streets in Marin County and in the study area. Recent highway improvements have ameliorated conditions somewhat, but a very small increase in traffic will offset the impact of these improvements.

The Highway 101 corridor is currently being studied by Marin County and its consultants (101 Corridor Committee) and Sonoma County and cities in order to develop potential solutions to traffic flow conditions on this freeway and throughout the corridor. This committee's study includes an examination of a potential bus or rail transit facility which would operate along the Northwestern Pacific Railroad corridor.

State Route 37

This east-west freeway currently operates at levels below its capacity in the vicinity of the study area.

Nave Drive

This road functions at acceptable levels of service, except at the intersection with Ignacio Boulevard (and the northbound freeway ramp, where the intersection operates at Level of Service "E" during the evening peak hour). The poor operation of this intersection adversely affects the operation of the intersection of Nave Drive and the northbound Highway 101 off-ramp. Traffic will back up from the northern intersection through this intersection, for short periods, and delay traffic for one or more cycle lengths. It also should be noted that Nave Drive serves as an alternative route to Highway 101 on occasions when the freeway becomes congested. On these occasions, northbound traffic will divert from Highway 101 to Nave Drive at the Alameda del Prado interchange, and drive north to the Ignacio Boulevard interchange. The recently constructed auxiliary lane between Ignacio Boulevard and Highway 37 has provided some relief from this condition.

Alameda del Prado

This roadway is also used as an alternative route to Highway 101. Most of this activity occurs during the morning peak hour when Highway 101 is operating at congested levels. The diversion from Highway 101 results in congested levels of operation at the intersection of Alameda del Prado and Ignacio Boulevard. Traffic was observed to follow

two routes to this frontage road. The first route involves exiting Highway 101 on the Ignacio Boulevard southbound straight ramp and the turning left at Alameda del Prado. The second route involves traveling south on Sunset Parkway, located to the west as shown in Figure 3.1.4-1, to Ignacio Boulevard and then turning right from Ignacio Boulevard to Alameda del Prado. The high number of right turns and left turns to southbound Alameda del Prado, as well as the queue which sometimes forms on southbound Sunset Parkway, are evidence of this activity. This condition is highly variable from day to day, as freeway congestion varies due to external factors.

As shown in Table 3.1.4-4, the intersection of Alameda del Prado with Ignacio Boulevard operates at Level of Service "A" during both the morning peak hour and the evening peak hour.

Ignacio Boulevard

In addition to the problems along Ignacio Boulevard cited above, several problems have not been mentioned. First, at the Ignacio Boulevard interchange, a high volume of left turns were observed from Enfrente Drive (which mostly consists of southbound off-ramp traffic); these could use the southbound loop-ramp instead, and improve the overall operation of the intersection. (Right turns from the loop-ramp have less impact than left turns from Enfrente Drive.) Second, during the evening peak hour a high volume of traffic approaches the interchange from Bel Marin Keys Boulevard. This volume was observed to be over 1,400 vehicles per hour during the evening peak hour. A queue which extended several intersections to the east was observed. On the northbound Highway 101 on-ramp, queues were observed to back-up from the freeway to Ignacio Boulevard, hindering traffic flows.

Main Entrance Road and State Access Road

These two roadways are lightly traveled and operate at uncongested levels of service during both the morning peak hour and evening peak hour.

Clay Court

This roadway feeds into Alameda del Prado at the Highway 101 overpass. Currently, traffic volumes are very light on this approach to the Alameda del Prado/Clay Court intersection.

South Novato Boulevard

This roadway handles light to moderate traffic, with existing levels of service currently at "A" during both the AM and PM peaks.

San Marin Drive

This street is currently uncongested, with the key intersection at South Novato Boulevard operating at LOS "A" during both AM and PM peak periods.

Grant Avenue

Grant Avenue operates at acceptable levels of service throughout the study area, with LOS "A" during both AM and PM peaks at its intersection with South Novato Boulevard.

Redwood Drive

Redwood Drive currently operates at the highest levels of service during both morning and evening peak periods.

Atherton Avenue

This street is lightly traveled and operates well below its capacity.

Olive Street

This lightly traveled street currently operates well below capacity at all times.

DeLong Avenue

DeLong Avenue, including its intersections with US 101 ramps, operates at acceptable levels of service at all times.

Rowland Boulevard

Rowland Boulevard currently operates at acceptable levels of service. Its intersections with U.S. 101 northbound and southbound ramps are estimated to operate at less than half their capacity during both AM and PM peak periods.

Sunset Parkway

Sunset Parkway operates at generally uncongested levels of service. At its intersection with South Novato Boulevard, a level of service "A" currently exists in the AM peak period, while the PM peak level of service was found to be "B."

Miller Creek Road

Miller Creek Road, including its intersection with U.S. 101 ramps, currently operates at high levels of service at all times.

Bel Marin Keys Boulevard

Bel Marin Keys Boulevard is currently impacted by congested levels of operation at the U.S. 101 northbound on ramp, particularly during the PM peak period when long queues form on Bel Marin Keys Boulevard. Operation of this intersection is described in detail elsewhere in this report.

EXISTING TRANSIT SERVICES

Currently, transit service to the area is provided by Golden Gate Transit. Bus stops for GGT route 80 are located along Highway 101 at the freeway interchanges at Alameda del Prado (near the Park-and-ride lot) and at Ignacio Boulevard. A second route, Route 50, stops at the Hamilton Field main gate. Otherwise, no public service is available for transport within the Hamilton Field area, except for airport service provided by Marin Airporter and Santa Rosa Airporter.

PLANNED ROADWAY AND TRANSIT IMPROVEMENTS

Several improvements are planned for both transit service and for an increase in highway capacity. These are discussed below.

Planned Transit Improvements

Two new routes are planned by Golden Gate Transit at this time. The first is scheduled for the 1989-90 fiscal year. The new route would provide commuter service to Bel Marin Keys. The second new route is only a conceptual plan at this time, since a funding source has not been identified. The planned route would provide a commuter service between

Sonoma County and Marin County, with connections at Bel Marin Keys and Hamilton Field. RIDES (a Caltrans sponsored TSM group) is becoming more involved in such a potential service, and could ultimately be the provider.

Over a longer term, development of a transit facility in the Northwest Pacific Railroad Right-of-Way appears to be increasingly possible, and is a central issue in the on-going U.S. 101 Corridor Study. For the purposes of this EIR, such a facility was assumed to be in place by 1997, consisting of a busway extending from Santa Rosa to Larkspur utilizing 40 to 80 passenger vehicles operating on 5 to 10 minute headways. The impact of the project without the transit facility was also evaluated. The analysis with transitway was included and emphasized to maintain consistency with other Marin and Sonoma County planning studies.

Planned Roadway Improvements

Several roadway improvements are planned in the study area. On Highway 101, improvements are planned between the Marinwood interchange and the State Route 37 interchange. The existing HOV lanes on Highway 101 would be extended in both directions from the Marinwood interchange to the State Route 37 interchange. An auxiliary lane has been constructed in the northbound direction between Ignacio Boulevard and State Route 37 since the time field surveillance and traffic counts for this study were undertaken. Recent CalTrans policy would require modification of the existing on-ramps to accommodate a HOV bypass lane for potential ramp-metering projects. These improvements are in the State Transportation Improvement Program (STIP) for the 1988-1989 fiscal year.

It was estimated that the planned HOV lanes would increase the capacity along Highway 101 by the equivalent of 1,700 vehicles per hour. While the HOV lane would not actually carry this volume of vehicles, it would likely carry an equivalent number of persons as a regular lane of traffic. A regular lane of freeway traffic serving 1,700 vehicles per hour would carry approximately 1,900 persons at 1.1 persons per vehicle.

Currently, approximately 400 vehicles per hour use the HOV lanes in Corte Madera in the south-bound direction during the morning peak hour. Of these, 70 are busses. Assuming 3.5 passengers per car (the minimum carpool is 3 persons per car) and 20 passengers per

bus, these HOV lanes carry 2,555 passengers per hour during the morning peak hour, or 34% more than the 1,900 passengers carried in a regular lane.

Since carpooling and bus use are more prevalent in southern Marin County, it was felt that the impact of the HOV lanes would be lower in the north. For this reason, a conservative estimate equivalent to 1,700 vehicles per hour is used throughout this report as an estimate of the increase in available vehicular capacity on Highway 101, where HOV lanes would be constructed. Furthermore, if it is found that the HOV lanes are underutilized, it would be possible to reduce the minimum requirement for a carpool from the current requirement of three persons per vehicle to a lower requirement of two persons per vehicle. Such a program would have the benefit of increasing the overall capacity of the freeway. This approach has been used in Orange County, and is currently being used on U.S. 101 in Santa Clara County. A demonstration project on Highway 101 in Marin County is also slated to begin this fall for a temporary trial period.

Over the longer term, further improvements to Highway 101 are likely, as is currently being studied by the Highway 101 Corridor Action Committee. It is assumed for this study that by 1997 Highway 101 would consist of eight lanes plus auxiliary lanes as far north as Atherton Road, and six lanes from there to the vicinity of the Sonoma County line. North of the Sonoma County line, six lanes were also assumed on Highway 101. The phasing and funding of these improvements are, nevertheless, uncertain at this time. For this reason, only programmed improvements were included in the analysis of Hamilton Field impacts. The improvements on Highway 101 which are currently in a planning stage are evaluated in the Cumulative Impact section.

Relationship to 101 Corridor Study

The Highway 101 Corridor Action Committee narrowed the number of alternatives for highway, arterial and transitway improvements in the 101 Corridor. Initially, eleven alternatives were tested. As of April 13, 1988, focus had narrowed to two alternatives:

- o Rail/Highway Alternative
- o Bus/Highway Alternative

All of these Alternatives envisioned some sort of transit on the NWPRR right-of way south of Novato, with the Rail/Highway Alternative proposing this service to extend from Larkspur to Santa Rosa. Three of the four alternatives envisaged such a service as a basic element, with the fourth (Bus/Highway Alternative) recommending only that the right-of-way be purchased and reserved for possible use after the year 2005. All four alternatives recommended widening Highway 101 to at least six lanes throughout the corridor, with two alternatives recommending that the Marin County portion of Highway 101 be widened to eight lanes. The Draft Sonoma County General Plan Circulation Element also calls for six lanes on Highway 101 in Southern Sonoma County.

Each of the two alternative plans also included a recommendation for "constructing, extending, and widening parallel arterials." Although no such improvements are included as basic assumptions in this study independent of the development of Hamilton Field, widening of Nave Drive is assumed as a project-related transportation improvement, and the issue of a McInnis Parkway alignment is discussed in the context of mitigation measures.

The highway and transit improvements included as basic assumptions in this report, although developed independently from the 101 Corridor Study, are generally consistent with the various alternatives still under consideration.

PROJECT TRAFFIC AND TRANSPORTATION FEATURES

This section presents special features of the project as proposed which would influence traffic operations. The project, as described in the Revised Hamilton Field Master Plan, includes specific proposed roadway improvements as well as a Transportation Systems Management (TSM) program, and use of the Northwest Pacific Railroad right-of-way as a transportation corridor. A description of the proposed roadway improvements and the proposed transportation systems management plan follows.

PLANNED PROJECT ROADWAY IMPROVEMENTS

Roadway improvements which were proposed at the time of the preparation of this study (April, 1988) as a part of the project are discussed below. These improvements were assumed to be in place for the traffic analyses conducted as a part of this study. Figure 3.1.4-2 illustrates the improvements listed below:

1. A new northbound on-ramp would be built between Alameda del Prado and Ignacio Boulevard at the location of the existing off-ramp to Nave Drive and Roblar Drive would be realigned to intersect the Highway 101 ramps to the north. It should be noted that CalTrans has reviewed preliminary design studies. It was assumed that all new ramps would be built to CalTrans specifications, including adequate lengths for merging activity at acceptable levels of service. Further design studies are underway to determine right-of-way requirements and the ultimate physical feasibility of the project in conjunction with the planned HOV lane project.
2. A third main access road to the site would be constructed. This roadway would be four lanes wide (two lanes in each direction). Hereafter, this roadway is referred to as "New Entrance Road."
3. The Ignacio Boulevard overcrossing would be widened and/or restriped for one additional lane for eastbound movements to Hamilton Field. The left turn lane from Ignacio Boulevard to Northbound Highway 101 would be eliminated.
4. Traffic signals would be installed at the New Entrance Road, State Access Road, Main Gate Road and at the intersection of Alameda del Prado and Clay Court.
5. State Access Road would be widened to four lanes.
6. Nave Drive would be widened to a 5-lane cross section between State Access Road and Ignacio Boulevard. A design study is underway to determine right-of-way requirements, safety and the physical feasibility of this project.

TRAFFIC REDUCTION PLAN

Transportation Systems Management (TSM) was conceived as a means to increase roadway system capacities with a minimum of capital investment. This can be achieved through better utilization of existing resources. Roadway capacity, measured in person-trips, can be increased without adding new freeway lanes and roadways by:

- o Increasing vehicle occupancy and alternate modes of travel; and
- o Spreading travel demand over a period of time, rather than concentrating demand in a peak-period.

In order to accomplish these goals, the project sponsor developed a Traffic Reduction Plan, which is incorporated in the Hamilton Field Revised Master Plan. Features of this plan are described below:

- o Provision for a transit station site immediately adjacent to the NWPRR right-of-way.

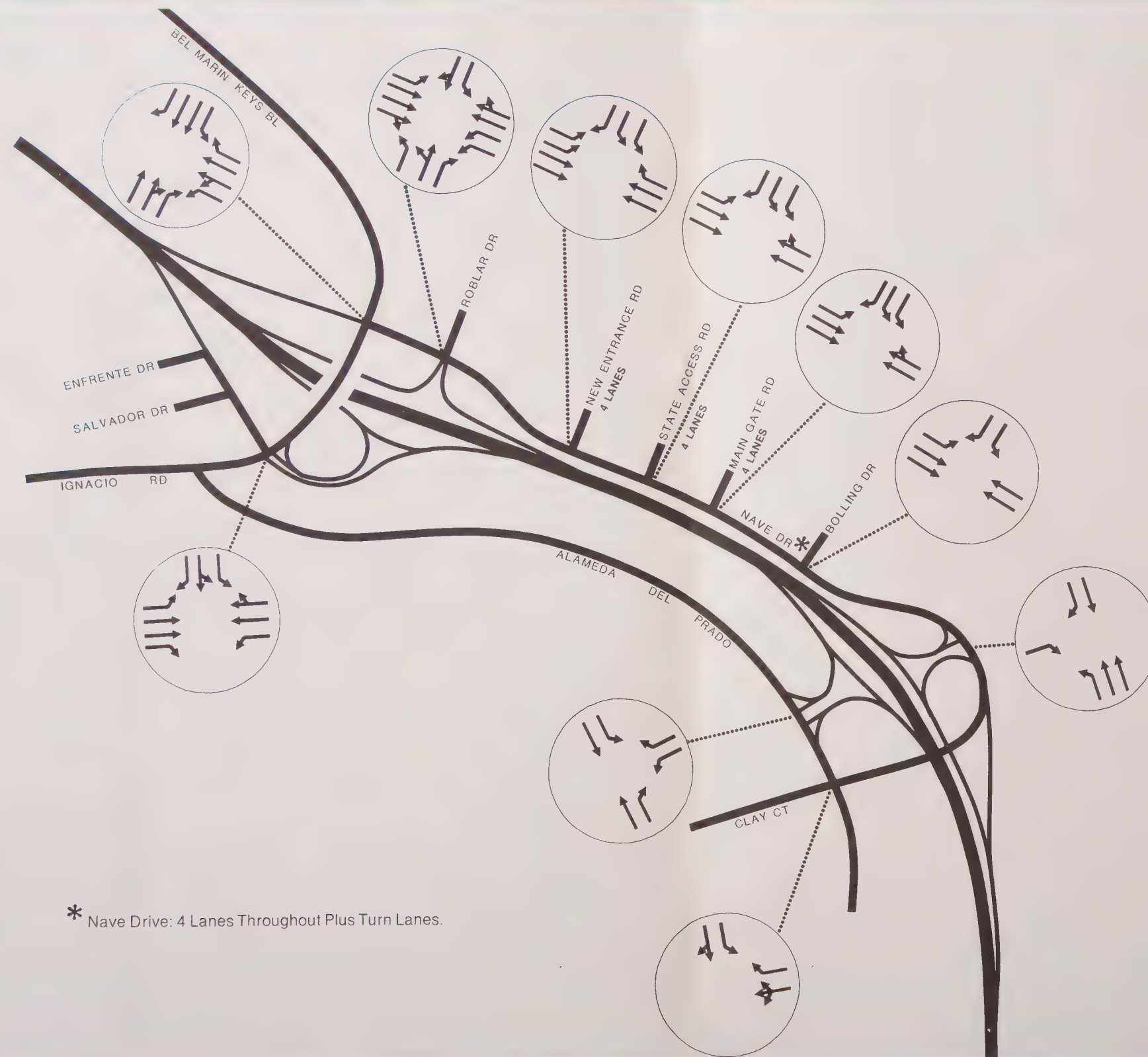
- o Payment of a public transit fee of \$1.00 per square foot of commercial space built and occupied to support the development of the NWPRR for public transit. If no progress has been made toward establishment of transit in the NWPRR corridor within three years, this money would be dedicated to local transit service improvements or other measures such as a Hamilton Field Shuttle.
- o Car pool and van pool incentives, including coordinating with CalTrans to promote park and ride lots, on-site car pool and van pool applicant matching, and priority parking for poolers.
- o Shuttle bus service for workers living off-site but nearby.
- o Requirements for staggered hours or flextime programs by major employers.
- o Ramp metering to spread out impacts on U.S. 101 or project entry traffic signal phasing control to limit outbound flows from Hamilton Field, if ramp metering is not feasible.
- o Parking management strategies including preferential treatment of car poolers and control of parking supply.
- o A monitoring program which will include installation of traffic counters, annual surveys of employees and periodic gate counts.
- o Provision of bikeways and bicycle lockers.

In addition to specific measures listed above, the current master plan includes certain design elements aimed at reducing traffic impacts compared with an earlier plan for development of the site. These elements include concentrating major employment near the potential transit facility on the NWPRR right of way, seeking large commercial tenants (more amenable to alternate modes of travel) and a mix of uses which will tend to reduce the amount of off-site travel. The latter would include integration of banking, medical, restaurant, retail and day care facilities with major employment areas on the site, as well as on-site for-sale homes and rental units which would reduce impacts to the north of the site.

The roadway improvements and traffic reduction plan described above were assumed to be an integral part of this project. For an analysis of the project's impacts without the proposed roadway improvements and TSM plan, see Technical Background Document C.

HAMILTON FIELD MASTER PLAN EIR

FIGURE 3.1.4-2



PROPOSED PROJECT APPROACH LANE GEOMETRY



SOURCE: WILBUR SMITH ASSOCIATES



IMPACTS

This section discusses the traffic impacts of the project as currently proposed and for three alternatives to the proposed project with differing land use assumptions.

METHODOLOGY

Overview

The standard three-step procedure for traffic impact analysis was applied in this study. These three steps are:

1. Trip Generation - The number of vehicle trips for each land use were estimated according to standard rates.
2. Trip Distribution - The directions of probable travel were estimated by adjusting observed existing travel patterns to account for shifts in employment and residential centers.
3. Traffic Assignment - The generated traffic of Step 1 was assigned to the roadway network along the most probable paths according to the distribution defined in Step 2.

The traffic assignment process did not include an estimate of the degree of future travel diversions from Highway 101 due to future freeway congestion. If Highway 101 congestion grows worse, it is likely that freeway traffic will infiltrate local streets to a greater degree. It has been estimated that future infiltration could reduce levels of service by as much as one to two level of service categories beyond the estimates of future levels of service if highway congestion increases. Due to the unpredictable nature of such estimates, this potential impact was not considered; but it is mentioned here so that the reader may be aware of the potential variations in traffic forecasts.

The approach taken for the EIR traffic analysis was to treat programmed roadway improvements plus project roadway improvements separately from regional roadway improvements which are currently in a planning phase. Accordingly, this section on impacts of the project includes only programmed roadway improvements (that is, improvements which are in the five-year State Transportation Improvement Program) plus project improvements (Figure 3.4.1-2, plus on-site improvements). The section on cumulative impacts considers planned roadway improvements which are consistent with current planning activities in Marin and Sonoma Counties.

Trip Generation

As shown in Table 3.1.4-6, the trip rates for various land uses differ significantly. The rates shown in this table were derived from various sources, including rates published by CalTrans and ITE. These rates were determined to be consistent with the type of development which would be constructed at Hamilton Field. All rates are for one-way driveway trips and were not adjusted at this stage to compensate for either sharing of trips between uses within the project, or the trips which remain within the project's boundaries. The resulting trip generation volumes at the proposed intensity of development are shown in Table 3.1.4-7.

Approximately 5,410 morning peak-hour one-way trips and 7,350 evening peak-hour one-way trips would be generated by the project. Based on the distribution assumptions discussed below, during the morning peak hour 4,020 trips would be external to the project site, and during the evening peak hour 4,570 trips would be external to the site. For a discussion of the sensitivity of the analysis to the selection of trip generation rates, see Technical Background Document C.

Trip Distribution

EIP Associates compiled and analyzed information from a marketing study by Economic Research Associates, Applied Development Economics (ADE), ABAG projections for housing and employment, and the NCRRC housing cost index. This information is contained in the Technical Background Document B. A recent origin/destination study prepared for the Highway 101 Corridor was not available for use at this time.

The analysis by EIP indicated that 16% of the work force could be expected to live in on-site housing and it was determined that 11% of the workers would live in other Novato locations, 32% would live to the south of the site, including Marin County, San Francisco, and locations to the southeast, and 41% would live to the north and northeast (Sonoma, Vallejo and Napa Counties). Trip distribution was assumed to correspond to these percentages.

Trips associated with the project's retail outlets would be predominantly internal. External residential based trips would be oriented to the employment centers to the south.

Table 3.1.4-6

ASSUMED TRIP GENERATION RATES

Hamilton Field Traffic Impact Study

<u>LAND USE</u>			<u>AM PEAK HOUR TRIP</u>		<u>PM PEAK HOUR TRIP</u>	
		<u>DAILY TRIP</u>	<u>GENERATION RATE</u>		<u>GENERATION RATE</u>	
<u>HOUSING</u>		<u>GENERATION RATE</u>	<u>INBOUND</u>	<u>OUTBOUND</u>	<u>INBOUND</u>	<u>OUTBOUND</u>
	o Apartments - per d.u.	6.1	0.10	0.44	0.46	0.22
	o Retirement Units ¹ - per d.u.	3.3	0.10	0.30	0.25	0.15
	o For Sale Housing - per d.u.	10.1	0.20	0.55	0.63	0.37
<u>MEDICAL</u>						
	o Hospital - per employee	5.2	0.22	0.08	0.22	0.06
	o Medical Office - per 1,000 sq. ft.	34.2	0.91	0.72	0.98	2.65
	o Specialized Conv Center - per bed	2.6	0.10	0.04	0.05	0.16
<u>RETAIL</u>						
	o Scattered Neighborhood Retail - per 1,000 sq. ft.	166.4	2.20	2.19	9.41	9.41
	o Retail Center (100 to 200 T.S.F.) per 1,000 sq. ft.	58.9	0.74	0.58	2.24	2.25
<u>OTHER COMMERCIAL</u>						
	o Hotel - per room	8.7	0.46	0.24	0.36	0.31
	o Office - per employee ²	3.4	0.44	0.07	0.08	0.40
	o Research and Development per 1,000 sq. ft.	6.1	1.13	0.11	0.15	0.84
	o Light Industrial - per 1,000 sq. ft.	7.0	0.84	0.12	0.12	0.91
	o Warehousing - per 1,000 sq. ft.	4.9	0.39	0.18	0.32	0.55

Source: Trip Generation, Fourth Edition, ITE, 1987

¹ Assumes that comprehensive retirement facilities are provided.

² Assumes 300 sq. ft. per employee

Wilbur Smith Associates, March 24, 1988

¹ Assumes that comprehensive retirement facilities are provided.

Table 3.1.4-7

TRIP GENERATION
HAMILTON FIELD TRAFFIC IMPACT STUDY

TYPE OF GENERATOR	SIZE	UNITS	DAILY TRIPS	AM PEAK HOUR TRIPS			PM PEAK HOUR TRIPS		
				INBOUND	OUTBOUND	TOTAL	INBOUND	OUTBOUND	TOTAL
APARTMENTS	2,600	d.u.	15,860	260	1,140	1,400	1,200	570	1,770
MEDICAL OFFICE	60	t.s.f.	2,050	50	40	90	60	160	220
HOTEL	200	rooms	1,740	90	50	140	70	60	130
RETIREMENT APARTMENT	550	d.u.	1,820	60	170	230	140	80	220
OFFICE (1)	2,300	employees	7,820	1,010	160	1,170	180	920	1,100
WAREHOUSING	300	t.s.f.	1,470	120	50	170	100	170	270
RESEARCH AND DEVELOPMENT	740	t.s.f.	4,510	840	80	920	110	620	730
HOSPITAL	431	employees	2,240	90	30	120	90	30	120
NURSING	480	beds-est.	1,250	50	20	70	20	80	100
NEIGHBORHOOD RETAIL	60	t.s.f.	9,980	130	130	260	560	560	1,120
RETAIL CENTER	190	t.s.f.	11,190	140	110	250	430	430	860
FOR SALE HOMES	400	d.u.	4,040	80	220	300	250	150	400
LIGHT INDUSTRIAL	300	t.s.f.	<u>2,100</u>	<u>250</u>	<u>40</u>	<u>290</u>	<u>40</u>	<u>270</u>	<u>310</u>
TOTAL			66,080	3,170	2,240	5,410	3,250	4,100	7,350

NOTES

(1) Assumes 300 square feet per employee.

SOURCE: Wilbur Smith Associates, May 24, 1988

Trips generated by employment generating land uses would be oriented to the north. The distribution assumptions for employment and residence-based trips are shown in Table 3.1.4-8. Residential-based trips were assumed to follow existing distribution patterns for Novato residents with a greater emphasis on internal trips, as defined above. Retail based trips were considered to be 95% internal for the neighborhood retail uses and 75% internal for a retail center. Work-based trips were distributed according to the employment analysis conducted by EIP. A discussion of the sensitivity of these assumptions is available in Technical Background Document C.

Traffic Reduction Due to TSM

The implementation of the proposed TSM program would reduce the vehicular traffic generated by the project. The analysis of the TSM program led to the conclusion that the reduction in vehicle trips which could be expected by a successful TSM program would be in the range of 6% to 10%. This estimate is consistent with the experience of current TSM programs and is consistent with the traffic forecast assumptions presented to CalTrans and informally approved by CalTrans for their use in preparing the PSR.

Each of the alternatives to solo driving listed below have the potential for reducing peak-hour vehicle trips; however, the effects of such measures are not additive, and in fact some measures tend to counteract others. Overall, a limited percentage of the population is willing to use a mode other than driving an automobile. This reduction may be distributed over a number of commute options, falling into three major categories:

- o Ridesharing
 - Vanpools
 - Carpools
 - Buspools
- o Transit
 - Express Buses
 - Light Rail
 - Heavy Rail
 - People Movers
 - Commuter Rail
- o Non-Motorized Transportation
 - Bicycles
 - Walking

Table 3.1.4-8

TRIP DISTRIBUTION - PROPOSED PROJECT

<u>ORIGIN OR DESTINATION (1)</u>	DISTRIBUTION OF WORKER TRIPS	DISTRIBUTION OF RESIDENT TRIPS
	<u>(percent)</u>	<u>(percent)</u>
North of Novato	36	2
South of Novato	32	47
East of Novato (S.R. 37)	5	4
Other Novato	11	23
Internal to Hamilton Field	<u>16</u>	<u>24</u>
TOTAL	100	100

(1) The same distribution percentage was applied to both inbound and outbound trips

Source: Wilbur Smith Associates, May 24, 1988

Other Measures. To encourage use of these alternatives to single-occupancy auto commuting, other measures can be incorporated. These strategies include:

- o High occupancy vehicle lanes (as planned) and ramp metering (not currently planned)
- o Preferential parking for ridesharing vehicles
- o Transit subsidies
- o Parking fees for single-occupant vehicles
- o Carpool/vanpool management program
- o Shuttle bus to transit station
- o Flexible working hours (as opposed to staggered working hours)

Specific details on the implementation of TSM programs are well documented in publications such as MTC's Traffic Mitigation Reference Guide (1984); MTC's Commute Alternatives Manual; and various publications by the U. S. Department of Transportation.

TSM Mitigation Potential -- An approach with strong favorable impacts would be a carpool/vanpool program coupled with employer-subsidized transit passes, employee parking fees and preferential parking. The number of persons shifting from single-occupant automobiles to ride-sharing could be as high as 12-15% for a ridesharing program, as shown in Table 3.1.4-9. For this analysis it was assumed that the program would include mandating use of carpooling/vanpooling survey/application forms for all employees on the site, preferential parking for ridesharing vehicles, and control of the supply of parking so that an amount less than current requirements would be provided. Assuming a 12-15% shift of solo drivers and an average occupancy of three persons per rideshare vehicle, an 8-10% reduction in vehicle trips could be expected, given the existing auto occupancy of 1.1 persons per vehicle. This estimate is consistent with the current Marin County goal of 9% trip reduction through TSM. The provision of transit subsidies would also be of benefit, as shown in Table 3.1.4-10.

Flextime or staggered hours programs would be beneficial in the short run and could be added to the TSM plan as required elements. The current peak period of travel of commuters to the north is short enough that shifting work hours for some employees could significantly reduce the impacts of the proposed project. In the long run, however, the peak period would be lengthened and for a flextime program to be effective, travel times would need to be shifted to even earlier (or later) times. Also, shifts away from the peak

TABLE 3.1.4-9
EFFECTIVENESS OF RIDESHARING PROGRAMS

<u>Program Strategy</u>	<u>Employee Survey/ Application Form</u>	<u>Parking Management</u>	<u>Percent of Employees Switching From Drive Alone to Ride Sharing</u>
A	Voluntary	Free parking for all employees	0-3
B	Required	Free parking for all employees	3-5
C	Required	Parking fees for all employees	5-12
D	Required	Reduced fees for rideshare participants	12-15

Source: "Traffic Mitigation Reference Guide." MTC. December, 1984.

TABLE 3.1.4-10
EFFECTIVENESS OF TRANSIT SUBSIDIES ON TRANSIT RIDERSHIP

<u>Amount of Transit Subsidy</u>	<u>Increase in Transit Use</u>
50% to 100%	5% to 10%

Source: "Traffic Mitigation Reference Guide," MTC. December, 1984.

TABLE 3.1.4-11
TRANSIT RIDERSHIP POTENTIAL

	MARIN/SONOMA COUNTY LINE Southbound AM Peak Hour Characteristics on Highway 101		
	<u>Existing</u>	<u>Year 1979²</u>	<u>Year 2005³</u>
Transit Ridership (person-trips/hr.)	480 ¹	1,210	2,760
Traffic Flow (vehicle/hr.)	3,400 ⁴	4,190	4,900
Ratio of Transit ridership to vehicle trips	0.141	0.289	0.563

¹ Average peak hour southbound AM person-trips for March, April, and May, 1988. Conversation with Al Zahradnik, June, 1988.

² Estimated by linear interpolation.

³ Average forecast for the Marin 101 Corridor Study.

⁴ Wilbur Smith Associates, 1988. Concurs with Sonoma County Transportation Technical Reports, Phase III. Final Report, DKS Associates, 1987.

were assumed to be a tradeoff with a ridesharing program. Consequently it was assumed that although a flextime program could provide some incremental improvements over the short term, the expected trip reduction over the longer term was assumed to remain near the 6% to 10% level for purposes of analysis in this study. This level is consistent with current Bay Area experience.

Traffic Reduction Due to Transit

The Marin Highway 101 Corridor Study prediction of future travel demand was utilized to estimate how much of the Hamilton Field travel demand would be captured by the proposed transitway. Year 2005 transit ridership was estimated to range from 2,050 to 3,500 person-trips in the southbound direction during the AM peak hour at the Marin/Sonoma County line.¹ The average of the 11 forecasts was 2,760 person trips per hour. Existing transit use is 480 person trips per hour during this period at the County line.² Comparing the ratio of existing transit use to existing traffic flows to this ratio for Year 1997 estimates as shown in Table 3.1.4-10, the Year 1997 ratio represents two times the existing ratio and transit ridership is expected to increase by 730 person-trips, which would be equivalent to about 650 vehicle trips without transit service. This represents about 13% reduction in vehicle trips.

Because the transit ridership estimates at this screenline include a number of Sonoma to San Francisco trips (which are projected in the 101 Corridor Study to have a 40% transit mode split by Year 2005), this future estimate was assumed to be too high. Also, the assumption that the mode split for Sonoma to Marin commuters would remain at 3% would be too low for the Hamilton Field project, which would be located close to the proposed transitway. In this study, it was assumed that the transitway would capture 5% to 10% of the vehicle trips generated by the Hamilton Field development over and beyond existing transit use.

Because the transitway would be completed with some of the TSM measures proposed for the project, the reductions for TSM (6 to 10%) and the reductions for transit (5% to 10%) would not likely reach a level of more than 18%, with an expected optimum range of 11 to 18% reduction for combined transit and TSM. The transit ridership estimate is conservative compared to the Marin Highway 101 Corridor Study transit ridership estimate for Year 2005.

PROPOSED PROJECT

Assumed land uses, trip generation, and trip distribution for the project as proposed are described in earlier sections of this report. Impacts of the project on the roadway network are discussed below. The traffic volumes utilized in this analysis reflect buildout conditions (Year 1997) at Hamilton Field with an 18% transit/TSM trip reduction factor as discussed above, plus existing traffic. Cumulative background growth was not considered in this part of the analysis so as to isolate the impacts of Hamilton Field. A subsequent section of this report deals with cumulative impacts.

U.S. 101 Impacts

Figure 3.1.4-3 illustrates the impacts of the project on U.S. 101 at three key locations: south of Alameda del Prado, south of Highway 37 and north of the Sonoma County line. The greatest impact of the proposed development would occur on Highway 101 to the north of the site. Currently, the freeway operates at or near capacity in the peak direction (northbound in the evening and southbound in the morning) at the northern end of the study area. The majority of the new freeway traffic generated by the project would be in the same direction as the current peak direction; thus existing levels of service would be expected to deteriorate further. No major impact would occur in the off-peak travel directions. The impacts during each of the peak periods are discussed in more detail below.

Morning Peak Hour Impacts. During the morning peak hour, an estimated 1,150 vehicles would approach the project from the north on southbound Highway 101. In the southbound direction, north of the site, four lanes plus an auxiliary lane are assumed to be available for through travel, including recent improvements and those programmed in the STIP for early implementation. The theoretical capacity of these lanes is 1,800 vehicles per hour per lane (half as much for the auxiliary lane), for a total of 8,100 vehicles in the peak hour. Current capacity of this section is 6,300 including the recently built auxiliary lane. While existing morning peak-hour volumes of 6,000 vehicles per hour are well below the assumed future capacity of this section, as well as below the existing capacity, conditions south of Novato frequently cause traffic to slow and back up to points north of Hamilton Field during this time period. The addition of 1,150 vehicles by the project will exacerbate this condition, though the total traffic (7,150 vehicles) on Southbound 101

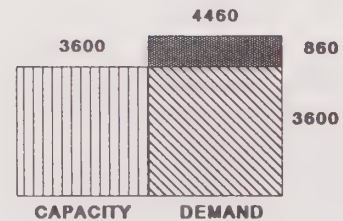
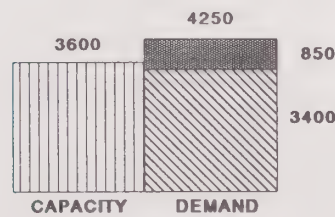
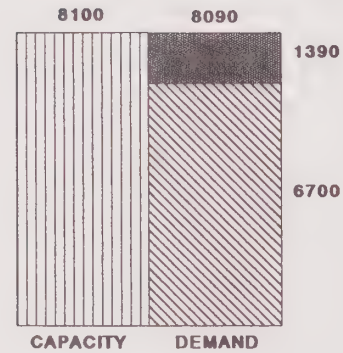
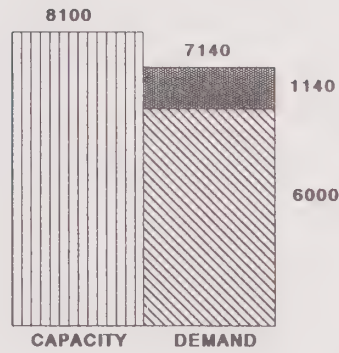
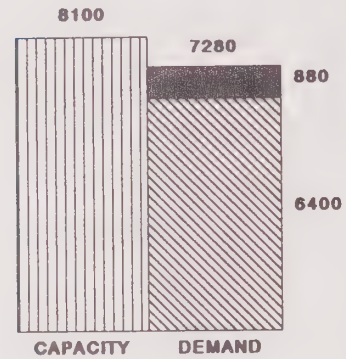
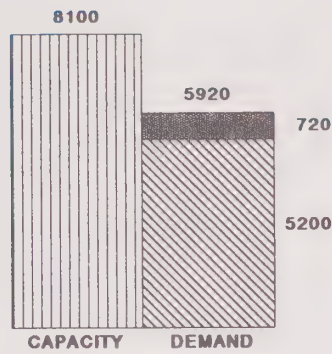
SOUTH OF ALAMEDA DEL PRADO

BETWEEN IGNACIO AND S.R. 37

NORTH OF COUNTY LINE

AM PEAK HOUR VEHICLE TRIPS (SOUTHBOUND)

PM PEAK HOUR VEHICLE TRIPS (NORTHBOUND)



HAMILTON



EXISTING

HAMILTON FIELD MASTER PLAN EIR

U.S. 101 IMPACTS



FIGURE 3.1.4-3

north of the site will still be within the theoretical capacity of 8,100 vehicles. Problems caused by the backup in traffic from the south will probably continue until the causes of congestion at bottlenecks in San Rafael are remedied.

Further north, in southern Sonoma County, conditions in the southbound direction during the AM peak are currently more severe, from a theoretical capacity standpoint, with existing peak hour volumes of 3,400 served by two lanes of traffic with a capacity of 3,600 vehicles. Thus, traffic on this segment is already at approximately 95% of capacity; the addition of another estimated 850 vehicles by the project in the AM peak will cause traffic on this section to exceed its theoretical capacity.

South of the site, the project will add approximately 720 southbound vehicles to the 5,200 already using U.S. 101 during the AM peak. This section has a theoretical capacity of 8,100 vehicles, compared with the estimated 5,920 vehicles (existing plus project traffic) which will use it. Thus, with project traffic, this section will still be operating at less than 75% of its theoretical capacity. As noted above, however, this section is also prone to delays due to backups "downstream" in the San Rafael vicinity.

Evening Peak Hour Impacts. The greatest impact of the project during the evening peak hour would be related to the volume of traffic leaving the site in the northbound direction. Approximately 1,400 vehicles would impact northbound U.S. 101 at a point south of Highway 37. This segment currently carries approximately 6,700 PM peak hour trips in the northbound direction. The estimated Year 1997 capacity of this section is 8,100 peak hour trips on four lanes plus an auxiliary lane. Thus, trips from Hamilton Field, combined with existing traffic, will bring this segment to capacity conditions.

Further north from the site, north of the Sonoma County line, existing traffic already equals the theoretical capacity of 3,600 vehicles during the PM peak in the northbound direction. At this location, the project is estimated to add another 865 PM peak trips in the northbound direction, bringing this segment over capacity.

To the south of the project site, at a point south of Alameda del Prado, 6,400 vehicles currently use 101 in the northbound direction during the PM peak. The Hamilton Field project will add an estimated 880 vehicles to this segment, bringing the total to 7,280

vehicles. This segment has an estimated Year 1997 capacity of 8,100 vehicles. Thus, with the additional traffic from the project, it will continue to function well within its theoretical capacity.

Highway 37 Impacts

The project would add approximately 150 westbound trips in the AM peak, and 160 eastbound trips in the PM to peak direction travel on Highway 37 east of U.S. 101. Currently, peak direction peak hour volumes on Highway 37 are 1,200 and 1,100 vehicles for AM and PM peaks respectively, on segments with a capacity of 3,600 vehicles. During the peak hours, the ramps to and from Highway 37 and the highway itself would operate at uncongested levels of service, except on occasions when Highway 101 congestion limits merging activity from the Highway 37 ramps. Forecasted traffic volumes on the Highway 37 interchange are contained in Technical Background Document C. CalTrans is currently studying the redesign of the U.S. 101/Highway 37 interchange; preliminary designs have been prepared for a configuration which will eliminate weaving sections.

Freeway Ramp Impacts

The adequacy of the existing and proposed highway ramps to handle project traffic is discussed below for both the morning and evening peak hour. The discussion is limited to the peak direction impacts. The surplus capacity in the off-peak directions would be adequate to accommodate the traffic generated by the project at acceptable levels of service.

Morning Peak Hour Impacts. Including the proposed ramp improvements, three southbound off-ramps would be available to traffic bound for Hamilton Field during the morning peak hour. Other ramps in the vicinity will also be impacted by traffic destined to and from the project. Table 3.1.4-12 lists volume/capacity ratios and levels of service for the intersections of U.S. 101 ramps with surface streets. As can be seen, all ramp intersection are projected to operate at Levels of Service of "C" or better under future conditions with the project during the AM peak period.

Evening Peak Hour Impacts. Including the new northbound ramp at the project site, a total of three ramps would be available for northbound traffic leaving the site during the

Table 3.1.4-12

FUTURE INTERSECTION LEVELS OF SERVICE -- WITH PROJECT AND TSM
HIGHWAY 101 RAMPS

<u>Intersection</u>	<u>Morning Peak Hour</u>		<u>Evening Peak Hour</u>	
	<u>Volume- Capacity Ratio</u>	<u>Level of Service</u>	<u>Volume- Capacity Ratio</u>	<u>Level of Service</u>
Ignacio Blvd/Southbound Ramps	0.59	A/B	0.47	A
Enfrente Blvd./Southbound Off-ramp	0.67	B	0.36	A
Ignacio Blvd/Northbound On-ramp (and Nave Drive)	0.70	B/C	0.82	D
Nave Drive/Northbound Ramps (Northern Ramps)	0.70	B/C	0.82	D
Alameda Del Prado/Southbound Ramps	0.72	C	0.75	C
Nave Drive/Northbound Ramps (Southern Ramps)	0.47	A	0.63	B
Miller Creek Rd./Northbound Ramps	0.23	A	0.48	A
Miller Creek Rd./Southbound Ramps	0.37	A	0.36	A
DeLong Ave./Southbound Ramps	0.69	B/C	0.56	A
DeLong Ave./Northbound Ramps	0.24	A	0.71	C
Rowland Blvd./Southbound Ramps	0.46	A	0.57	A
Rowland Blvd./Northbound Ramps	0.33	A	0.53	A

Source: Wilbur Smith Associates, May 24, 1988

PM peak hour. Other ramps in the vicinity of Hamilton Field will also be impacted by traffic from the project. As seen in Table 3.1.4-12, the Ignacio Boulevard/northbound on-ramp intersection and the northern Nave Drive/Northbound U.S. 101 on-ramp are projected to operate at LOS "D" during the PM peak with the project as currently proposed. (The actual calculated volume/capacity ratios of 0.82 for each intersection put them at the low end of the LOS "D" range, i.e., near the threshold of LOS "C.") Other freeway ramp intersections are projected to operate at Level of Service "C" or better during the PM peak period.

It should be noted that the analyses presented in Table 3.1.4-12 assume mainline capacity on Highway 101 sufficient to maintain orderly flow through the ramp intersections. In reality, periods of congestion on Highway 101 will, at times, cause problems at freeway on-ramp intersections with local streets due to excessive queuing.

Local Intersection Impacts

Table 3.1.4-13 illustrates future volume/capacity ratios and levels of service at local intersections under the proposed plan for Hamilton Field. With the assumed project and non-project improvements in place, these intersections should continue to operate at acceptable levels of service during both AM and PM peak periods. It should be noted that these impacts do not include estimates of diverted trips from Highway 101. Congested conditions on the freeway could lead to conditions where the levels of service shown in Table 3.1.4-13 could decrease to unsatisfactory levels. For a more detailed analysis, see Technical Background Document C.

Nave Drive and Site Access Impacts

Three roadways would provide access to the site from Nave Drive: Main Gate Road, State Access Road, and the proposed New Entrance Road. The impacts of the project as proposed are analyzed in Technical Background Document C, and summarized in Table 3.1.4-13. As seen in this table, each of these intersections would function at Level of Service "C" or better during both morning and evening peak periods under normal conditions. During periods of mainline congestion on U.S. 101, spillover of through traffic onto Nave Drive could result in a worsening of these levels of service. It should be noted that these calculations assumed that Nave Drive would be widened to four lanes plus

Table 3.1.4-13

FUTURE INTERSECTION LEVELS OF SERVICE -- WITH PROJECT AND TSM
SURFACE STREETS

<u>Intersection</u>	<u>Morning Peak Hour</u>		<u>Evening Peak Hour</u>	
	<u>Volume- Capacity Ratio</u>	<u>Level of Service</u>	<u>Volume- Capacity Ratio</u>	<u>Level of Service</u>
Ignacio Blvd./Sunset Pkwy.	0.38	A	0.45	A
Ignacio Blvd./Alameda del Prado	0.39	A	0.55	A
Alameda Del Prado/Clay Ct.	0.57	A	0.55	A
Olive Ave./Redwood Rd.	0.56	A	0.72	C
Atherton Ave/Olive Ave.	0.38	A	0.59	A/B
DeLong Ave./Redwood Rd.	0.42	A	0.62	B
S. Novato Blvd/Grant Ave.	0.39	A	0.54	A
S. Novato Blvd./San Marin Dr.	0.61	B	0.52	A
S. Novato Blvd./Sunset Pkwy.	0.65	B	0.78	C
Nave Dr./State Access Rd.	0.69	B/C	0.69	B/C
Nave Dr./Main Gate Rd.	0.65	B	0.72	C
Nave Dr./New Entrance Rd.	0.47	A	0.76	C
Nave Dr./Bolling Rd.	0.38	A	0.42	A

Source: Wilbur Smith Associates, May 24, 1988

designated turn lanes. Providing fewer than four lanes on Nave Drive would create a "bottleneck," resulting in poor levels of service and congested conditions.

Impacts Without TSM

The basic analysis assumed that the combined effects of transit usage (assuming a transit facility on the Northwest Pacific Railroad right-of-way) and TSM measures specifically contained in the revised plan for Hamilton Field would amount to a reduction of 18% in vehicle trips generated by the project. In order to identify the sensitivity of the traffic projections to success of TSM, a "worst case" analysis was undertaken which assumed no reduction in trips through transit or TSM.

Figure 3.1.4-4 illustrates the impacts on Highway 101, and Tables 3.1.4-14 and 3.1.4-15 list the volume/capacity ratios and levels of service for freeway ramp intersections and surface street intersections, respectively. On Highway 101, absence of TSM or transit service effects on traffic generated by the project would lead to 160 to 310 more vehicles on U.S. 101 during peak periods, depending on location and direction. This condition would lead to demand in excess of capacity during the PM peak in the northbound direction between Hamilton Field and State Route 37, in addition to the segments which would be above capacity even with TSM and transit reduction in trips (north of the Sonoma County line).

At intersections of U.S. 101 ramps with surface streets, the northern Nave Drive/U.S. 101 on-ramp and the Ignacio Boulevard/Nave Drive/U.S. 101 Ramp intersections would show a level of service degradation from low "D" to high "D" (volume/capacity ratio above 0.85) during the PM peak. The Alameda del Prado/Southbound U.S. 101 ramps intersection would also operate at level of service "D" during both peak periods, compared with a "C" level of service if effects of TSM and transit use are assumed. At surface street intersections, Nave Drive at Main Gate Road and Nave Drive at New Entrance Road would be impacted the most under the No TSM scenario, with PM peak levels of service of "D" rather than the level "C" projected under the basic assumptions.

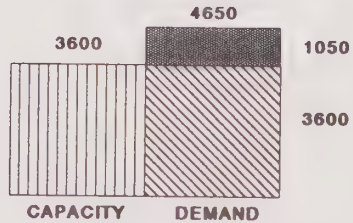
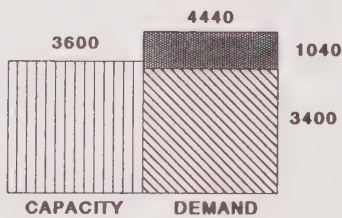
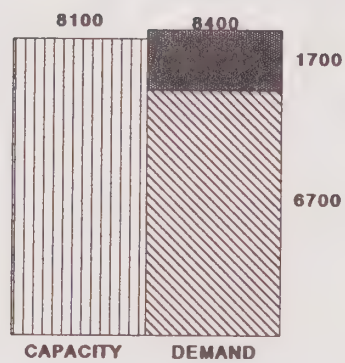
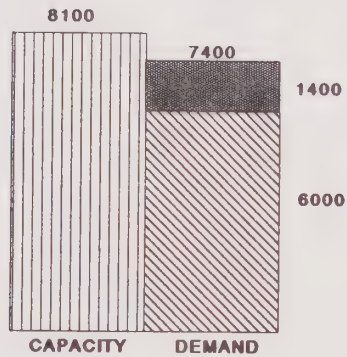
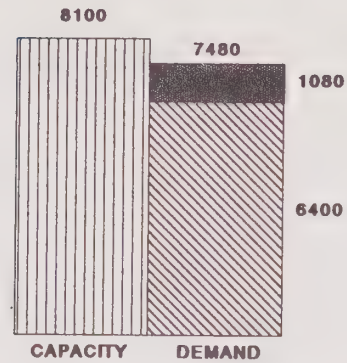
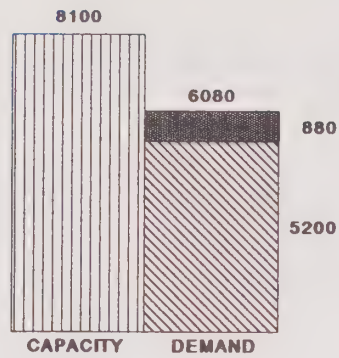
SOUTH OF ALAMEDA DEL PRADO

BETWEEN IGNACIO AND S.R. 37

NORTH OF COUNTY LINE

AM PEAK HOUR VEHICLE TRIPS (SOUTHBOUND)

PM PEAK HOUR VEHICLE TRIPS (NORTHBOUND)



HAMILTON



EXISTING

**HAMILTON FIELD
MASTER PLAN
EIR**

**U.S.101 IMPACTS
WITHOUT TSM**



FIGURE 3.1.4-4

Table 3.1.4-14

FUTURE INTERSECTION LEVELS OF SERVICE -- WITH PROJECT (NO TSM)
HIGHWAY 101 RAMPS

<u>Intersection</u>	<u>Morning Peak Hour</u>		<u>Evening Peak Hour</u>	
	<u>Volume- Capacity Ratio</u>	<u>Level of Service</u>	<u>Volume- Capacity Ratio</u>	<u>Level of Service</u>
Ignacio Blvd/Southbound Ramps	0.88	D	0.63	B
Enfrente Blvd./Southbound Off-ramp	0.67	B	0.36	A
Ignacio Blvd/Northbound On-ramp (and Nave Drive)	0.77	C	0.87	D
Nave Drive/Northbound Ramps (Northern Ramps)	0.77	C	0.87	D
Alameda Del Prado/Southbound Ramps	0.84	D	0.88	D
Nave Drive/Northbound Ramps (Southern Ramps)	0.54	A	0.70	B/C
Miller Creek Rd./Northbound Ramps	0.22	A	0.47	A
Miller Creek Rd./Southbound Ramps	0.36	A	0.35	A
DeLong Ave./Southbound Ramps	0.68	B	0.54	A
DeLong Ave./Northbound Ramps	0.23	A	0.70	B/C
Rowland Blvd./Southbound Ramps	0.45	A	0.56	A
Rowland Blvd./Northbound Ramps	0.32	A	0.52	A

Source: Wilbur Smith Associates, May 24, 1988

Table 3.1.4-15

FUTURE INTERSECTION LEVELS OF SERVICE -- WITH PROJECT (NO TSM)
SURFACE STREETS

<u>Intersection</u>	<u>Morning Peak Hour</u>		<u>Evening Peak Hour</u>	
	<u>Volume- Capacity Ratio</u>	<u>Level of Service</u>	<u>Volume- Capacity Ratio</u>	<u>Level of Service</u>
Ignacio Blvd./Sunset Pkwy.	0.39	A	0.46	A
Ignacio Blvd./Alameda del Prado	0.40	A	0.56	A
Alameda Del Prado/Clay Ct.	0.64	B	0.62	B
Olive Ave./Redwood Rd.	0.57	A	0.73	C
Atherton Ave/Olive Ave.	0.40	A	0.61	B
DeLong Ave./Redwood Rd.	0.43	A	0.63	B
S. Novato Blvd/Grant Ave.	0.40	A	0.56	A
S. Novato Blvd./San Marin Dr.	0.62	B	0.53	A
S. Novato Blvd./Sunset Pkwy.	0.67	B	0.79	C/D
Nave Dr./State Access Rd.	0.80	C/D	0.79	C/D
Nave Dr./Main Gate Rd.	0.76	C	0.83	D
Nave Dr./New Entrance Rd.	0.54	A	0.87	D
Nave Dr./Bolling Rd.	0.45	A	0.51	A

Source: Wilbur Smith Associates, 1988

ALTERNATIVE 1: DECREASED HOUSING, INCREASED JOBS

One alternative to the project as currently proposed involves a reduction in housing and an increase in employment-intensive land uses. This alternative envisions 3,250 residential units, compared to 3,550 as proposed, with a reduction in the rental units accounting for the difference. It also proposes an increase in office use of 200,000 square feet to 890,000 square feet, compared to the 690,000 square feet in the proposed plan.

Trip Generation

Table 3.1.4-16 summarizes the projected trip generation of Alternative 1. This alternative would generate a total of 66,520 daily one-way trips, which is less than one percent more than the project as proposed (66,080 daily trips). However, due to the heavier emphasis on employment related uses, Alternative 1 would generate a more significant increase in peak-hour, peak direction trips. AM inbound trips would be approximately 8.5% higher for Alternative 1 than for the proposed plan (3,440 trips versus 3,170), and there would be approximately 5% more PM peak outbound trips (4,310 versus 4,100).

Trip Distribution

Table 3.1.4-17 lists the assumed trip distribution for Alternative 1. This distribution is basically similar to that assumed for the proposed project, except that with more jobs and fewer housing units on the site, a higher percentage of the residents of Hamilton Field would work on site.

U.S. 101 Impacts

Figure 3.1.4-5 illustrates the Year 1997 impacts of Project Alternative 1 on U.S. 101 at the three key screenline locations defined above. As with the proposed project, the majority of new traffic generated by Alternative 1 would be in the same direction as existing peak hour traffic. Impacts of this Alternative would be felt the most immediately to the north of the site, with approximately 1200 vehicles added to existing traffic southbound in the AM peak, and an equal number added to northbound traffic in the PM peak. The impacts of Alternative 1 during each of the peak periods are described below.

Table 3.1.4-16

TRIP GENERATION - ALTERNATIVE 1
HAMILTON FIELD TRAFFIC IMPACT STUDY

TYPE OF GENERATOR	SIZE	UNITS	DAILY ONE-WAY TRIPS	AM PEAK HOUR TRIPS			PM PEAK HOUR TRIPS		
				INBOUND	OUTBOUND	TOTAL	INBOUND	OUTBOUND	TOTAL
APARTMENTS	2,300	d.u.	14,030	230	1,010	1,240	1,060	510	1,570
MEDICAL OFFICE	60	t.s.f.	2,050	50	40	90	60	160	220
HOTEL	200	rooms	1,740	90	50	140	70	60	130
RETIREMENT APARTMENT	550	d.u.	1,820	60	170	230	140	80	220
OFFICE (1)	2,967	employees	10,090	1,310	210	1,520	240	1,190	1,430
WAREHOUSING	300	t.s.f.	1,470	120	50	170	100	170	270
RESEARCH AND DEVELOPMENT	740	t.s.f.	4,510	840	80	920	110	620	730
HOSPITAL	431	employees	2,240	90	30	120	90	30	120
NURSING	480	beds-est.	1,250	50	20	70	20	80	100
NEIGHBORHOOD RETAIL	60	t.s.f.	9,980	130	130	260	560	560	1,120
RETAIL CENTER	190	t.s.f.	11,190	140	110	250	430	430	860
FOR SALE HOMES	400	d.u.	4,040	80	220	300	250	150	400
LIGHT INDUSTRIAL	300	t.s.f.	2,100	250	40	290	40	270	310
TOTAL			66,520	3,440	2,160	5,600	3,170	4,310	7,480

NOTES

(1) Assumes 300 square feet per employee.

SOURCE: Wilbur Smith Associates, May 24, 1988

Table 3.1.4-17

TRIP DISTRIBUTION - PROJECT ALTERNATIVE 1

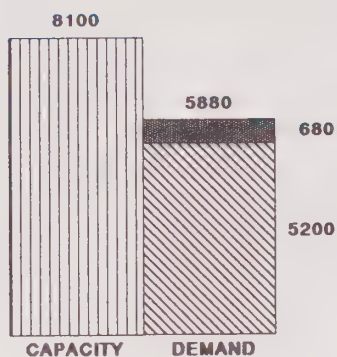
<u>ORIGIN OR DESTINATION (1)</u>	<u>DISTRIBUTION OF WORKER TRIPS (percent)</u>	<u>DISTRIBUTION OF RESIDENT TRIPS (percent)</u>
North of Novato	36	2
South of Novato	31	47
East of Novato (S.R. 37)	5	4
Other Novato	11	11
Internal to Hamilton Field	<u>17</u>	<u>36</u>
TOTAL	100	100

(1) The same distribution percentage was applied to both inbound and outbound trips

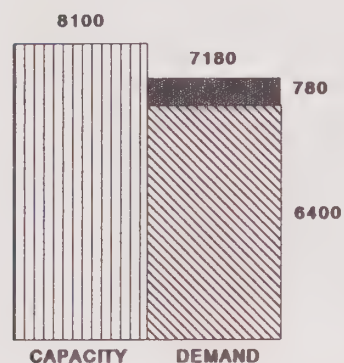
Source: Wilbur Smith Associates, May 24, 1988

SOUTH OF ALAMEDA DEL PRADO

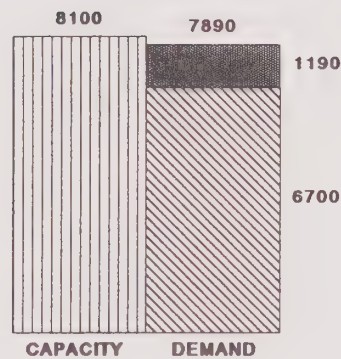
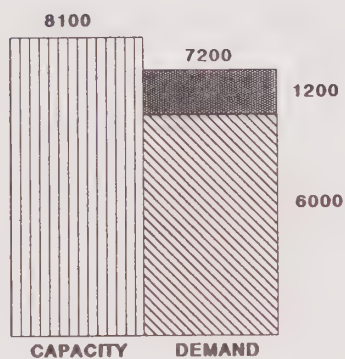
AM PEAK HOUR VEHICLE TRIPS
(SOUTHBOUND)



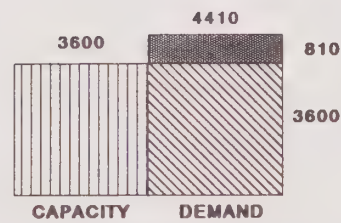
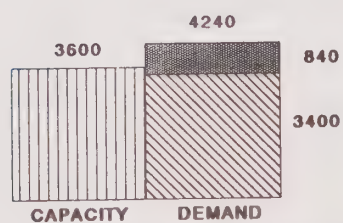
PM PEAK HOUR VEHICLE TRIPS
(NORTHBOUND)



BETWEEN IGNACIO AND S.R. 37



NORTH OF COUNTY LINE



HAMILTON



EXISTING

HAMILTON FIELD
MASTER PLAN
EIR

U.S. 101 IMPACTS
PROJECT ALTERNATIVE #1



FIGURE 3.1.4-5

Morning Peak Hour Impacts. During the morning peak hour, an estimated 1200 vehicles would approach the project from the north. These vehicles would be added to an existing 6,000 vehicles, for a total of 7,200. The assumed Year 1997 theoretical capacity for this section of Highway 101 is 8,100 (as described above). Thus, traffic on the segment immediately north of the Project would be well within its theoretical capacity. However, as discussed above for the Project as proposed, southbound traffic on Highway 101 during the AM peak is subject to delays caused by bottlenecks further downstream in the vicinity of San Rafael.

At the northernmost screenline, north of the Sonoma County line, Project Alternative 1 is expected to add approximately 800 new vehicles in the southbound direction during the AM peak to the existing 3,400 vehicles, bringing this segment over its theoretical capacity of 3,600 vehicles.

To the south of the project site, Alternative 1 is projected to generate approximately 680 southbound vehicles during the AM peak. When added to the existing 5,200 AM peak southbound vehicles, the total volume of approximately 5,880 vehicles will be well within the 8,100 vehicle capacity of this section.

Evening Peak Hour Impacts. As was the case with AM peak hour projections, the greatest impact of Alternative 1 during the PM peak would be at the screenline immediately north of the project site. Alternative 1 would add an estimated 1,190 northbound vehicles to the existing 6,700 for a total of 7,890 vehicles, or approximately 97% of the section's theoretical capacity of 8,100.

North of the Sonoma County line, Alternative 1 would add approximately 810 vehicles in the northbound direction during the PM peak. As discussed above, this segment is currently operating at its theoretical capacity of 3,600 vehicles per hour.

South of the project site, Alternative 1 is projected to add approximately 780 vehicles to the existing 6,400 northbound vehicles during the evening peak hour. This total of 7,180 vehicles would represent approximately 89% of the segment's Year 1997 theoretical capacity of 8,100 vehicles.

Highway 37 Impacts

Alternative 1 would add approximately 130 westbound trips to the AM peak, and an equal number of eastbound trips to the PM peak direction travel on Highway 37 east of U.S. 101. Currently, peak direction peak hour volumes on Highway 37 are 1,200 and 1,100 vehicles for AM and PM peaks, respectively, on segments with a capacity of 3,600 vehicles. During the peak hours, the ramps to and from Highway 37 and the highway itself would operate at uncongested levels of service, except on occasions when Highway 101 congestion limits merging activity from the Highway 37 ramps.

Freeway Ramp Impacts

The adequacy of the existing and proposed highway ramps in the vicinity of the project is discussed below for Alternative 1 during both the morning and evening peak hour. The discussion is limited to the peak direction impacts. The surplus capacity in the off-peak directions would be adequate to accommodate the traffic generated by the project at acceptable levels of service.

Morning Peak Hour Impacts. Table 3.1.4-18 lists volume/capacity ratios and levels of service for the intersections of U.S. 101 ramps with surface streets during the AM peak for project Alternative 1. As can be seen, Level of Service of "C" or higher are projected for all ramp intersections under future conditions with project Alternative 1 during the AM peak period.

Evening Peak Hour Impacts. As seen in Table 3.1.4-18, the Ignacio/U.S. 101 NB on-ramp and the Nave Drive/U.S. 101 NB on-ramp are projected to operate at Level of Service "D" (though just at the LOS "C" threshold). Other freeway ramp intersections are projected to operate at Level of Service "C" or better during the PM peak period under Alternative 1.

As noted previously, the analyses presented in Table 3.1.4-18 assume mainline capacity on Highway 101 sufficient to maintain orderly flow through the ramp intersections. In reality, periods of congestion of Highway 101 will, at times, cause problems at freeway on-ramp intersections with local streets due to excessive queuing.

Table 3.1.4-18

FUTURE INTERSECTION LEVELS OF SERVICE -- ALTERNATIVE 1 WITH TSM
HIGHWAY 101 RAMPS

<u>Intersection</u>	<u>Morning Peak Hour</u>		<u>Evening Peak Hour</u>	
	<u>Volume- Capacity Ratio</u>	<u>Level of Service</u>	<u>Volume- Capacity Ratio</u>	<u>Level of Service</u>
Ignacio Blvd/Southbound Ramps	0.59	A/B	0.43	A
Enfrente Blvd./Southbound Off-ramp	0.62	B	0.36	A
Ignacio Blvd/Northbound On-ramp (and Nave Drive)	0.71	C	0.80	C/D
Nave Drive/Northbound Ramps (Northern Ramps)	0.71	C	0.80	C/D
Alameda Del Prado/Southbound Ramps	0.69	B/C	0.79	C
Nave Drive/Northbound Ramps (Southern Ramps)	0.49	A	0.64	B
Miller Creek Rd./Northbound Ramps	0.23	A	0.48	A
Miller Creek Rd./Southbound Ramps	0.37	A	0.36	A
DeLong Ave./Southbound Ramps	0.69	B	0.52	A
DeLong Ave./Northbound Ramps	0.24	A	0.65	B
Rowland Blvd./Southbound Ramps	0.46	A	0.53	A
Rowland Blvd./Northbound Ramps	0.33	A	0.51	A

Source: Wilbur Smith Associates, May 24, 1988

Local Intersection Impacts

Table 3.1.4-19 illustrates future volume/capacity ratios and levels of service at local intersections under project Alternative 1 for Hamilton Field. With the assumed project and non-project improvements in place, these intersections should continue to operate at acceptable levels of service during both AM and PM peak periods. As noted above, these impacts do not include estimates of diverted trips from Highway 101. Congested conditions on the freeway could lead to conditions where the levels of service shown in Table 3.1.4-19 could decrease to unsatisfactory levels.

Nave Drive and Site Access Impacts

Three roadways would provide access to the site from Nave Drive: Main Gate Road, State Access Road, and the proposed New Entrance Road. The impacts of the project as proposed are summarized in Table 3.1.4-19. As seen in this table, each of these intersections would function at Level of Service "C" or better during both morning and evening peak periods under normal conditions. During periods of mainline congestion on U.S. 101, spillover of through traffic onto Nave Drive could result in a worsening of these levels of service. This analysis assumed that a four-lane cross-section would be built through the length of Nave Drive. A narrow width would not function.

ALTERNATIVE 2: DECREASED HOUSING, DECREASED JOBS

Alternative 2 to the project features a reduction in both housing units and employee-intensive land uses. Housing units would be reduced by more than 40% to 2,000 and employment generating land uses would be reduced by about 14% from 2.9 million square feet to 2.5 million square feet.

Trip Generation

As would be expected, Alternative 2 would generate substantially fewer trips than the project as proposed, due to the reduction in intensity. As shown by Table 3.1.4-20, Alternative 2 would generate approximately 42,000 daily trips compared with 66,000 for the project as proposed, or a reduction of approximately 36%. For peak hour, peak direction trips, AM inbound trips would be reduced by approximately 15% to 2,700 trips, while PM peak outbound trips would be reduced by approximately 26% to 3,000 trips.

Table 3.1.4-19

FUTURE INTERSECTION LEVELS OF SERVICE -- ALTERNATIVE 1 WITH TSM
SURFACE STREETS

<u>Intersection</u>	<u>Morning Peak Hour</u>		<u>Evening Peak Hour</u>	
	<u>Volume- Capacity Ratio</u>	<u>Level of Service</u>	<u>Volume- Capacity Ratio</u>	<u>Level of Service</u>
Ignacio Blvd./Sunset Pkwy.	0.36	A	0.42	A
Ignacio Blvd./Alameda del Prado	0.37	A	0.52	A
Alameda Del Prado/Clay Ct.	0.49	A	0.54	A
Olive Ave./Redwood Rd.	0.54	A	0.69	B/C
Atherton Ave/Olive Ave.	0.34	A	0.30	A
DeLong Ave./Redwood Rd.	0.37	A	0.57	A
S. Novato Blvd/Grant Ave.	0.37	A/B	0.42	A
S. Novato Blvd./San Marin Dr.	0.59	A	0.50	A
S. Novato Blvd./Sunset Pkwy.	0.61	B/C	0.73	C
Nave Dr./State Access Rd.	0.70	C	0.69	B/C
Nave Dr./Main Gate Rd.	0.68	B	0.72	C
Nave Dr./New Entrance Rd.	0.47	A	0.76	C
Nave Dr./Bolling Rd.	0.40	A	0.42	A

Source: Wilbur Smith Associates, May 24, 1988

Table 3.1.4-20

TRIP GENERATION -- Alternative 2
HAMILTON FIELD TRAFFIC IMPACT STUDY

TYPE OF GENERATOR	SIZE	UNITS	DAILY ONE-WAY TRIPS	AM PEAK HOUR TRIPS			PM PEAK HOUR TRIPS		
				INBOUND	OUTBOUND	TOTAL	INBOUND	OUTBOUND	TOTAL
APARTMENTS	1,550	d.u.	9,460	160	680	840	710	340	1,050
MEDICAL OFFICE	53	t.s.f.	1,810	50	40	90	50	140	190
HOTEL	150	rooms	1,310	70	40	110	50	50	100
RETIREMENT APARTMENT	250	d.u.	830	30	80	110	60	40	100
OFFICE (1)	2,300	employees	7,820	1,010	160	1,170	180	920	1,100
WAREHOUSING	300	t.s.f.	980	80	40	120	60	110	170
RESEARCH AND DEVELOPMENT	740	t.s.f.	4,510	840	80	920	110	620	730
HOSPITAL	380	employees	1,980	80	30	110	80	20	100
NURSING	420	beds-est.	1,090	40	20	60	20	70	90
NEIGHBORHOOD RETAIL	24	t.s.f.	3,990	50	50	100	230	230	460
RETAIL CENTER	76	t.s.f.	4,480	60	40	100	170	170	340
FOR SALE HOMES	200	d.u.	2,020	40	110	150	130	70	200
LIGHT INDUSTRAIL	250	t.s.f.	1,750	210	30	240	30	230	260
TOTAL			42,040	2,720	1,400	4,120	1,880	3,010	4,890

NOTES

(1) Assumes 300 square feet per employee.

SOURCE: Wilbur Smith Associates, May 24, 1988

Trip Distribution

Table 3.1.4-21 illustrates the assumed distribution of trips for Alternative 2. This distribution is essentially the same as assumed for the proposed project, except for the fact that a higher percentage of residents of Hamilton Field are assumed to work on site.

U.S. 101 Impacts

Figure 3.1.4-6 illustrates the Year 1997 impacts of Project Alternative 2 on U.S. 101 at the three key screenline locations defined above. As with the proposed project and Alternative 1, the majority of new traffic generated by Alternative 2 would be in the same direction as existing peak hour traffic. Impacts of this Alternative would be felt the most immediately to the north of the site, with approximately 1,020 vehicles added to existing traffic southbound in the AM, and 970 added to northbound traffic in the PM peak. The impacts of Alternative 2 during each of the peak periods are described below.

Morning Peak Hour Impacts. During the morning peak hour, approximately 1020 vehicles would approach the project from the north at the screenline immediately north of the project (south of Highway 37). Existing traffic at this point is 6,000 southbound vehicles. The combined total of approximately 7,020 would represent approximately 87% of the segment's theoretical capacity of 8,100 vehicles. However, as noted above for the proposed project and for Alternative 1, actual operating conditions could be somewhat worse if downstream bottlenecks cause traffic to back up to this vicinity, as is currently the case.

North of the Sonoma County line, the project is estimated to add approximately 730 vehicles in the southbound direction during the AM peak which, added to the existing traffic of 3,400 vehicles, would cause this section to carry traffic in excess of its theoretical capacity of 3,600 vehicles.

At the southernmost screenline, south of Alameda del Prado, approximately 450 project vehicles would be added to the existing volume of 5,200 vehicles, raising the total number of southbound AM peak vehicles on this segment to 5,650 vehicles, which would represent approximately 70% of this segment's theoretical capacity of 8,100.

Table 3.1.4-21

TRIP DISTRIBUTION - PROJECT ALTERNATIVE 2

<u>ORIGIN OR DESTINATION (1)</u>	<u>DISTRIBUTION OF WORKER TRIPS (percent)</u>	<u>DISTRIBUTION OF RESIDENT TRIPS (percent)</u>
North of Novato	37	2
South of Novato	33	47
East of Novato (S.R. 37)	5	4
Other Novato	11	9
Internal to Hamilton Field	<u>14</u>	<u>38</u>
TOTAL	100	100

(1) The same distribution percentage was applied to both inbound and outbound trips

Source: Wilbur Smith Associates, May 24, 1988

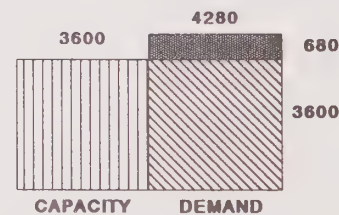
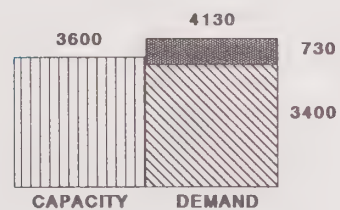
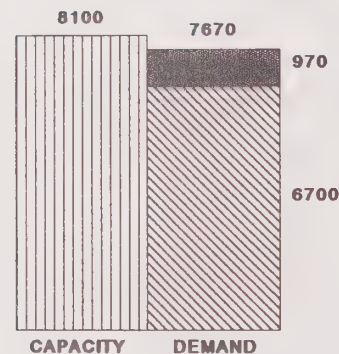
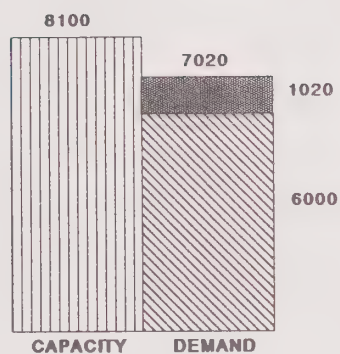
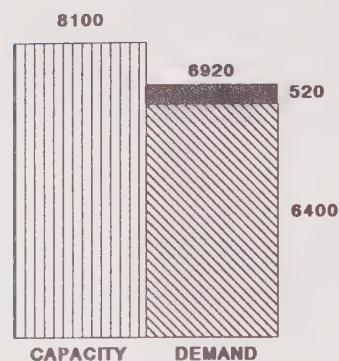
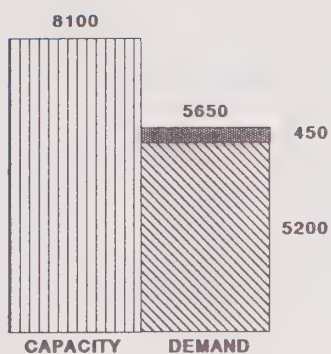
SOUTH OF ALAMEDA DEL PRADO

BETWEEN IGNACIO AND S.R. 37

NORTH OF COUNTY LINE

AM PEAK HOUR VEHICLE TRIPS (SOUTHBOUND)

PM PEAK HOUR VEHICLE TRIPS (NORTHBOUND)



HAMILTON



EXISTING

**HAMILTON FIELD
MASTER PLAN
EIR**

**U.S. 101 IMPACTS
PROJECT ALTERNATIVE #2**

FIGURE 3.1.4-6

Evening Peak Hour Impacts. During the evening peak, Alternative 2 would add approximately 970 northbound vehicles to the segment immediately north of the project site. Combined with the existing 6,700 vehicles, the total traffic at this point would be approximately 7,670 vehicles, compared with a theoretical capacity of 8,100 vehicles at this location.

North of the Sonoma County line, Alternative 2 would add approximately 680 vehicles northbound in the PM peak, bringing the total traffic to approximately 4,280 vehicles, or 680 vehicles more than its theoretical capacity.

At the southernmost screenline, Project Alternative 2 is estimated to add 520 vehicles in the northbound direction in the PM peak. Existing traffic on this section is 6,400 northbound vehicles. The addition of project traffic to this volume will bring the total to approximately 6,920 vehicles, or 85% of the theoretical capacity of this section.

Highway 37 Impacts

Alternative 2 would add approximately 110 westbound trips in the AM peak, and 100 eastbound trips in the PM to peak direction travel on Highway 37 east of U.S. 101. Currently, peak direction peak hour volumes on Highway 37 are 1,200 and 1,100 vehicles for AM and PM peaks respectively, on segments with a capacity of 3,600 vehicles. During the peak hours, the ramps to and from Highway 37 and the highway itself would operate at uncongested levels of service, except on occasions when Highway 101 congestion limits merging activity from the Highway 37 ramps.

Freeway Ramp Impacts

The adequacy of the existing and proposed highway ramps in the vicinity of the project is discussed below for Alternative 2 during both the morning and evening peak hour. The discussion is limited to the peak direction impacts. The surplus capacity in the off-peak directions would be adequate to accommodate the traffic generated by the project at acceptable levels of service.

Morning Peak Hour Impacts. Table 3.1.4-22 lists volume/capacity ratios and levels of service for the intersections of U.S. 101 ramps with surface streets during the AM peak for project Alternative 2. As can be seen, all ramp intersections are projected to operate at Level of Service "C" or better under future conditions with project Alternative 2 during the AM peak period.

Evening Peak Hour Impacts. As seen in Table 3.1.4-22, all freeway ramp intersections are projected to operate at Level of Service "C" or better during the PM peak period under Alternative 2.

As noted previously, the analyses presented in Table 3.1.4-22 assume mainline capacity on Highway 101 sufficient to maintain orderly flow through the ramp intersections. In reality, periods of congestion on Highway 101 will, at times, cause problems at freeway on-ramp intersections with local streets due to excessive queuing.

Local Intersection Impacts

Table 3.1.4-23 illustrates future volume/capacity ratios and levels of service at local intersections under project Alternative 2 for Hamilton Field. With the assumed project and non-project improvements in place, these intersections should continue to operate at acceptable levels of service during both AM and PM peak periods. As noted above, these impacts do not include estimates of diverted trips from Highway 101. Congested conditions on the freeway could lead to conditions where the levels of service shown in Table 3.1.4-23 could decrease to unsatisfactory levels.

Nave Drive and Site Access Impacts

Three roadways would provide access to the site from Nave Drive: Main Gate Road, State Access Road, and the proposed New Entrance Road. The impacts of the project as proposed are summarized in Table 3.1.4-23. As seen in this table, each of these intersections would function at Level of Service "C" or better during both morning and evening peak periods under normal conditions. During periods of mainline congestion on U.S. 101, spillover of through traffic onto Nave Drive could result in a worsening of these levels of service. A four-lane minimum cross-section would be required for the entire length of Nave Drive.

Table 3.1.4-22

FUTURE INTERSECTION LEVELS OF SERVICE -- ALTERNATIVE 2 WITH TSM
HIGHWAY 101 RAMPS

<u>Intersection</u>	<u>Morning Peak Hour</u>		<u>Evening Peak Hour</u>	
	<u>Volume- Capacity Ratio</u>	<u>Level of Service</u>	<u>Volume- Capacity Ratio</u>	<u>Level of Service</u>
Ignacio Blvd/Southbound Ramps	0.56	A	0.38	A
Enfrente Blvd./Southbound Off-ramp	0.52	A	0.36	A
Ignacio Blvd/Northbound On-ramp (and Nave Drive)	0.68	B	0.74	C
Nave Drive/Northbound Ramps (Northern Ramps)	0.62	B	0.74	C
Alameda Del Prado/Southbound Ramps	0.65	B	0.64	B
Nave Drive/Northbound Ramps (Southern Ramps)	0.43	A	0.55	A
Miller Creek Rd./Northbound Ramps	0.22	A	0.47	A
Miller Creek Rd./Southbound Ramps	0.36	A	0.35	A
DeLong Ave./Southbound Ramps	0.68	B	0.51	A
DeLong Ave./Northbound Ramps	0.23	A	0.66	B
Rowland Blvd./Southbound Ramps	0.45	A	0.52	A
Rowland Blvd./Northbound Ramps	0.32	A	0.51	A

Source: Wilbur Smith Associates, May 24, 1988

Table 3.1.4-23

FUTURE INTERSECTION LEVELS OF SERVICE -- ALTERNATIVE 2 WITH TSM
SURFACE STREETS

<u>Intersection</u>	<u>Morning Peak Hour</u>		<u>Evening Peak Hour</u>	
	<u>Volume- Capacity Ratio</u>	<u>Level of Service</u>	<u>Volume- Capacity Ratio</u>	<u>Level of Service</u>
Ignacio Blvd./Sunset Pkwy.	0.34	A	0.41	A
Ignacio Blvd./Alameda del Prado	0.35	A	0.51	A
Alameda Del Prado/Clay Ct.	0.47	A	0.46	A
Olive Ave./Redwood Rd.	0.52	A	0.68	B
Atherton Ave/Olive Ave.	0.34	A	0.28	A
DeLong Ave./Redwood Rd.	0.36	A	0.56	A
S. Novato Blvd/Grant Ave.	0.35	A	0.50	A
S. Novato Blvd./San Marin Dr.	0.58	A	0.49	A
S. Novato Blvd./Sunset Pkwy.	0.59	A/B	0.71	C
Nave Dr./State Access Rd.	0.60	A/B	0.58	A
Nave Dr./Main Gate Rd.	0.59	A/B	0.57	A
Nave Dr./New Entrance Rd.	0.41	A	0.65	B
Nave Dr./Bolling Rd.	0.34	A	0.35	A

Source: Wilbur Smith Associates, May 24, 1988

ALTERNATIVE 3: INCREASED HOUSING, DECREASED JOBS

Alternative 3 features a higher ratio of residential land uses to employment-intensive land uses at the Hamilton Field site. Overall, Alternative 3 would provide 200 more housing units in the rental unit category, and a 40% reduction in job-producing uses from 2.9 million square feet to 1.7 million square feet.

Trip Generation

As shown in Table 3.1.4-24, Alternative 3 to the project as proposed would reduce the total number of daily trips from 66,000 to approximately 63,000, or a 5% reduction. Due to shift in type of land use, however, peak-hour peak-direction trips would be reduced more significantly, or approximately 21% for AM peak inbound trips and 13% for PM peak outbound trips.

Trip Distribution

Table 3.1.4-25 illustrates the assumed distribution of trips for Alternative 3. This distribution is essentially similar to that assumed for the project as proposed, except that a smaller percentage of residents is assumed to make internal trips (i.e., work on site) due to the increase in the number of housing units and the decrease in the number of jobs.

U.S. 101 Impacts

Figure 3.1.4-7 illustrates the Year 1997 impacts of Project Alternative 3 on U.S. 101 at the three key screenline locations defined above. As with the proposed project and the other alternatives, the majority of new traffic generated by Alternative 3 would be in the same direction as existing peak hour traffic. Impacts of this Alternative would be felt the most immediately to the north of the site, with approximately 850 vehicles added to existing traffic southbound in the AM, and 950 added to northbound traffic in the PM peak. The impacts of Alternative 3 during each of the peak periods are described below.

Morning Peak Hour Impacts. During the morning peak hour, approximately 850 vehicles would approach the site from the north under Alternative 3. Combined with an existing volume of 6,000 vehicles, total traffic on the southbound U.S. 101 segment would total

Table 3.1.4-24

**TRIP GENERATION -- Alternative 3
HAMILTON FIELD TRAFFIC IMPACT STUDY**

TYPE OF GENERATOR	SIZE	UNITS	DAILY ONE-WAY TRIPS	AM PEAK HOUR TRIPS			PM PEAK HOUR TRIPS		
				INBOUND	OUTBOUND	TOTAL	INBOUND	OUTBOUND	TOTAL
APARTMENTS	2,800	d.u.	17,080	280	1,230	1,510	1,290	620	1,910
MEDICAL OFFICE	60	t.s.f.	2,050	50	40	90	60	160	220
HOTEL	200	rooms	1,740	90	50	140	70	60	130
RETIREMENT APARTMENT	550	d.u.	1,820	60	170	230	140	80	220
OFFICE (1)	2,300	employees	7,820	1,010	160	1,170	180	920	1,100
WAREHOUSING	300	t.s.f.	740	60	30	90	50	80	130
RESEARCH AND DEVELOPMENT	290	t.s.f.	1,770	330	30	360	40	240	280
HOSPITAL	431	employees	2,240	90	30	120	90	30	120
NURSING	480	beds-est.	1,250	50	20	70	20	80	100
NEIGHBORHOOD RETAIL	60	t.s.f.	9,980	130	130	260	560	560	1,120
RETAIL CENTER	190	t.s.f.	11,190	140	110	250	430	430	860
FOR SALE HOMES	400	d.u.	4,040	80	220	300	250	150	400
LIGHT INDUSTRIAL	150	t.s.f.	1,050	130	20	150	20	140	160
TOTAL			62,780	2,500	2,240	4,740	3,200	3,550	6,750

NOTES

(1) Assumes 300 square feet per employee.

SOURCE: Wilbur Smith Associates, May 24, 1988

Table 3.1.4-25

TRIP DISTRIBUTION - PROJECT ALTERNATIVE 3

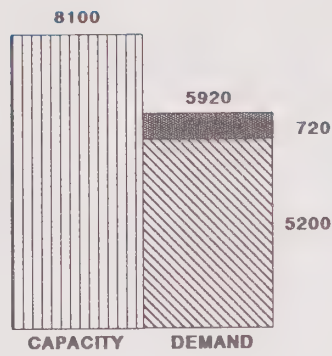
<u>ORIGIN OR DESTINATION (1)</u>	<u>DISTRIBUTION OF WORKER TRIPS (percent)</u>	<u>DISTRIBUTION OF RESIDENT TRIPS (percent)</u>
North of Novato	36	2
South of Novato	29	47
East of Novato (S.R. 37)	5	4
Other Novato	11	27
Internal to Hamilton Field	<u>19</u>	<u>20</u>
TOTAL	100	100

(1) The same distribution percentage was applied to both inbound and outbound trips

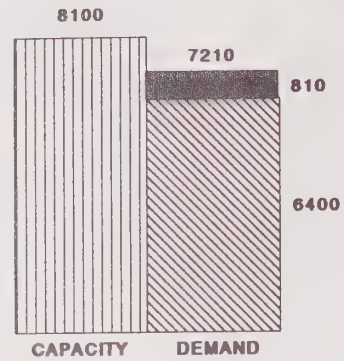
Source: Wilbur Smith Associates, May 24, 1988

SOUTH OF ALAMEDA DEL PRADO

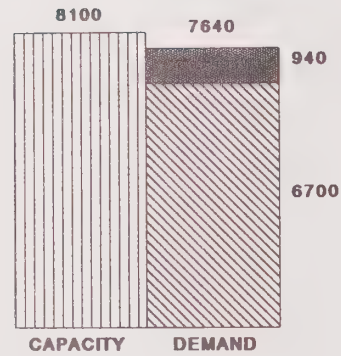
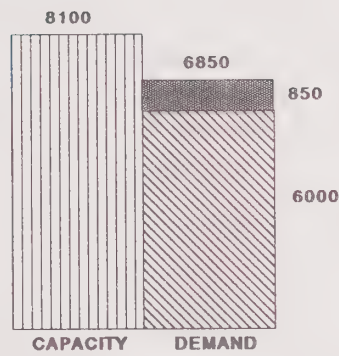
AM PEAK HOUR VEHICLE TRIPS
(SOUTHBOUND)



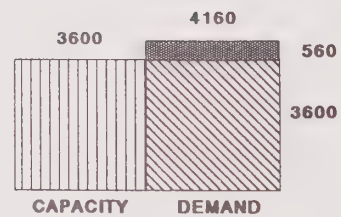
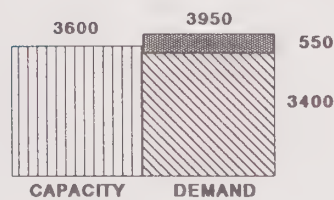
PM PEAK HOUR VEHICLE TRIPS
(NORTHBOUND)



BETWEEN IGNACIO AND S.R. 37



NORTH OF COUNTY LINE



HAMILTON



EXISTING

HAMILTON FIELD
MASTER PLAN
EIR

U.S. 101 IMPACTS
PROJECT ALTERNATIVE #3

FIGURE 3.1.4-7

6,850 vehicles. This total would amount to approximately 85% of the theoretical capacity of the segment under assumed Year 1997 geometrics. As with all other alternatives, however, traffic on this section would not necessarily flow smoothly due to the existing constraints downstream in the San Rafael area, which frequently cause traffic to back up as far as the project environs.

Further north, at a screenline north of the Sonoma County line, project Alternative 3 is projected to add approximately 550 vehicles to the existing traffic of 3,400 southbound vehicles during the AM peak hour. The total of 3,950 would be in excess of the theoretical capacity of 3,600 vehicles, assuming Year 1997 geometrics are the same as at present.

At the southernmost screenline, south of Alameda del Prado, project Alternative 3 is projected to add approximately 720 vehicles in the southbound direction during the AM peak hour. This segment currently carries approximately 5,200 vehicles. The projected total of 5,920 vehicles would amount to approximately 73% of this segment's capacity.

Evening Peak Hour Impacts. At the screenline point south of Highway 37, approximately 940 vehicles will be added by project Alternative 3 to northbound traffic during the PM peak hour. This additional traffic would bring the total to approximately 7,640 vehicles on this segment, or approximately 94% of the theoretical capacity of the segment with assumed Year 1997 geometrics.

At the screenline north of the Sonoma County line, project Alternative 3 is projected to add approximately 560 vehicles to the northbound direction during the PM peak hour. Existing volumes on this segment amount to approximately 3,600 vehicles on a segment whose theoretical capacity is 3,600. The additional traffic from the project will thus strain the capacity of this segment beyond its limits.

To the south of the project site, at a screenline south of Alameda del Prado, project Alternative 3 is projected to add approximately 810 northbound vehicles during the PM peak hour to the existing volume of 6,400. The resultant 7210 vehicles will thus bring traffic on this segment to approximately 89% of its theoretical capacity of 8,100 vehicles.

Highway 37 Impacts

Alternative 3 would add approximately 90 westbound trips in the AM peak, and 100 eastbound trips in the PM to peak direction travel on Highway 37 east of U.S. 101. Currently, peak direction peak hour volumes on Highway 37 are 1,200 and 1,100 vehicles for AM and PM peaks respectively, on segments with a capacity of 3,600 vehicles. During the peak hours, the ramps to and from Highway 37 and the highway itself would operate at uncongested levels of service, except on occasions when Highway 101 congestion limits merging activity from the Highway 37 ramps.

Freeway Ramp Impacts

The adequacy of the existing and proposed highway ramps in the vicinity of the project is discussed below for Alternative 3 during both the morning and evening peak hour. The discussion is limited to the peak direction impacts. The surplus capacity in the off-peak directions would be adequate to accommodate the traffic generated by the project at acceptable levels of service.

Morning Peak Hour Impacts. Table 3.1.4-26 lists volume/capacity ratios and levels of service for the intersections of U.S. 101 ramps with surface streets during the AM peak for project Alternative 2. As can be seen, at all ramp intersections, Levels of Service of "C" or higher are projected under future conditions with project Alternative 2 during the AM peak period.

Evening Peak Hour Impacts. As seen in Table 3.1.4-26, all freeway ramp intersections are projected to operate at LOS "C" or better during the PM peak period for project Alternative 3.

As noted previously, the analyses presented in Table 3.1.4-26 assume mainline capacity on Highway 101 sufficient to maintain orderly flow through the ramp intersections. In reality, periods of congestion of Highway 101 will, at times, cause problems at freeway on-ramp intersections with local streets due to excessive queuing.

Local Intersection Impacts

Table 3.1.4-27 illustrates future volume/capacity ratios and levels of service at local intersections under project Alternative 3 for Hamilton Field. With the assumed project

Table 3.1.4-26

FUTURE INTERSECTION LEVELS OF SERVICE -- ALTERNATIVE 3 WITH TSM
HIGHWAY 101 RAMPs

<u>Intersection</u>	<u>Morning Peak Hour</u>		<u>Evening Peak Hour</u>	
	<u>Volume- Capacity Ratio</u>	<u>Level of Service</u>	<u>Volume- Capacity Ratio</u>	<u>Level of Service</u>
Ignacio Blvd/Southbound Ramps	0.67	B	0.48	A
Enfrente Blvd./Southbound Off-ramp	0.53	A	0.36	A
Ignacio Blvd/Northbound On-ramp (and Nave Drive)	0.64	B	0.76	C
Nave Drive/Northbound Ramps (Northern Ramps)	0.60	C/B	0.76	C
Alameda Del Prado/Southbound Ramps	0.72	C	0.63	B
Nave Drive/Northbound Ramps (Southern Ramps)	0.43	A	0.62	B
Miller Creek Rd./Northbound Ramps	0.21	A	0.48	A
Miller Creek Rd./Southbound Ramps	0.35	A	0.36	A
DeLong Ave./Southbound Ramps	0.69	B/C	0.55	A
DeLong Ave./Northbound Ramps	0.24	A	0.70	B/C
Rowland Blvd./Southbound Ramps	0.46	A	0.56	A
Rowland Blvd./Northbound Ramps	0.33	A	0.52	A

Source: Wilbur Smith Associates, May 24, 1988

Table 3.1.4-27

**FUTURE INTERSECTION LEVELS OF SERVICE -- ALTERNATIVE 3 WITH TSM
Surface Streets**

<u>Intersection</u>	<u>Morning Peak Hour</u>		<u>Evening Peak Hour</u>	
	<u>Volume- Capacity Ratio</u>	<u>Level of Service</u>	<u>Volume- Capacity Ratio</u>	<u>Level of Service</u>
Ignacio Blvd./Sunset Pkwy.	0.37	A	0.45	A
Ignacio Blvd./Alameda del Prado	0.39	A	0.55	A
Alameda Del Prado/Clay Ct.	0.60	C/B	0.46	A
Olive Ave./Redwood Rd.	0.55	A	0.70	B/C
Atherton Ave/Olive Ave.	0.37	A	0.33	A
DeLong Ave./Redwood Rd.	0.38	A	0.59	A/B
S. Novato Blvd/Grant Ave.	0.38	A	0.54	A
S. Novato Blvd./San Marin Dr.	0.60	C/B	0.53	A
S. Novato Blvd./Sunset Pkwy.	0.64	B	0.76	C
Nave Dr./State Access Rd.	0.60	C/B	0.67	B
Nave Dr./Main Gate Rd.	0.54	A	0.68	B
Nave Dr./New Entrance Rd.	0.43	A	0.67	B
Nave Dr./Bolling Rd.	0.28	A	0.34	A

Source: Wilbur Smith Associates, May 24, 1988

and non-project improvements in place, these intersections should continue to operate at acceptable levels of service during both AM and PM peak periods. As noted above, these impacts do not include estimates of diverted trips from Highway 101. Congested conditions on the freeway could lead to conditions where the levels of service shown in Table 3.1.4-27 could decrease to unsatisfactory levels.

Nave Drive and Site Access Impacts

Three roadways would provide access to the site from Nave Drive: Main Gate Road, State Access Road, and the proposed New Entrance Road. The impacts of the project as proposed are analyzed in Technical Background Document C, and summarized in Table 3.1.4-27. As seen in this table, each of these intersections would function at Level of Service "C" or better during both morning and evening peak periods under normal conditions. During periods of mainline congestion on U.S. 101, spillover of through traffic onto Nave Drive could result in a worsening of these levels of service. A four-lane minimum cross-section would be required to accommodate traffic on Nave Drive at acceptable levels of service.

CUMULATIVE IMPACTS

An evaluation was undertaken of the increases in cumulative (non-project) traffic in the study area and the impacts of this traffic on study area roadways both with and without the Hamilton Field project.

Methodology

Two components of future traffic growth were projected separately -- other nearby development, and growth in through traffic on 101 due to regional considerations. The methodology used in projecting these two components is discussed below.

Other Nearby Development. Numerous potential projects in the Alameda del Prado/Ignacio Boulevard/Bel Marin Keys area would have an impact on the local roadway system. The incremental increase in land use assumed in this study is reflected by the list of projects shown in Table 3.1.4-28. This growth represents buildout conditions in the study area under the City of Novato General Plan. The projects shown in Table 3.1.4-28 include land uses which are long-term plans, short-term plans, approved projects, and projects under construction or newly built but unoccupied at the time of the traffic counts.

Table 3.1.4-28

TRIP GENERATION FOR OTHER CUMULATIVE GROWTH PROJECTS IN STUDY AREA
U.S. 101/S.R. 37 PSR Traffic Study

Project	Type of Development	Size of Development	Daily Trips	Morning Peak Hour Trips		Evening Peak Hour Trips	
				Inbound	Outbound	Inbound	Outbound
Ignacio Industrial Park	Industrial	150,000 sq. ft	1,045	115	35	120	30
Oakgrove	Apartments	119 d.u.	780	10	50	50	20
Posada West	Apartments	38 d.u.	250	5	20	20	10
Marin Glen	Single Family Home	80 d.u.	800	20	40	60	20
Anderson-Rowe	Apartments	595 d.u.	3,860	60	230	230	120
	Office	156,000 sq. ft.	2,230	280	30	60	250
Pacheco Station	Condominium	196 d.u.	1,020	15	70	140	60
Indian Hills	Single Family Homes	10 du.u.	100	2	6	7	3
MCC Estates B	Single Family Homes	14 d.u.	140	5	10	10	5
Indian Valley College	College	3,000 students ¹	2,800	250	30	10	50
Marin County Club	Single Family Homes	60 d.u.	600	10	30	40	20
Baytree Park	Single Family Home	24 d.u.	240	5	15	15	10
Hillside Park 3	Single Family Home	105 d.u.	1,050	20	60	70	40
Galli Square	Office	21,000 sq. ft.	300	40	5	10	30
Novato Hills Estates	Single Family Homes	24 d.u.	240	5	10	17	7
College	Increased Enrollment	2,000 people	2,000	170	20	30	10
Bel Marin Keys	Single Family Homes	800 units	<u>8,000</u>	<u>170</u>	<u>440</u>	<u>500</u>	<u>300</u>
TOTAL NEW TRIPS			25,455	1,182	1,101	1,389	985

¹ Indian Valley College was not holding classes while existing background counts were conducted.

Source: Wilbur Smith Associates and the City of Novato, 1988.

Assumed trip distribution for the other projects in the Novato area is shown in Table 3.1.4-29. Because residential trips were not separated from retail trips in deriving this distribution, the freeway distribution shown in this table falls between the values used for Hamilton Field residential and Hamilton Field commercial land uses.

Growth on U.S. 101. Current studies by the Sonoma County and Highway 101 Corridor Committee were utilized to estimate future increases in through traffic on Highway 101 for the Year 1997.

"Draft Technical Memorandum No. 11, Travel Forecast for Phase II Transportation Alternatives" (Barton-Aschman Associates, Inc., October, 1987) presented Year 2005 AM peak hour flows in the peak direction on Highway 101 which ranged from 4,740 vehicles per hour to 5,250 vehicles per hour at the Sonoma/Marin county line. The Sonoma County Transportation Technical Reports, Phase III Final Report (DKS Associates, 1988) estimates the Year 2005 flows at this location to be 4,500 to 4,700 vehicles per hour in the peak direction during the AM peak hour on this segment, which closely agrees with the 101 Corridor Committee estimates.

For the purposes of this study, the AM peak hour southbound demand of 4,900 vehicle hours was selected as a conservative estimate of Year 2005 demand. It was also assumed that a straight line projection would sufficiently predict growth to the Year 1997. The existing volume on this segment is 3,400 vehicles per hour. Accordingly, straight line growth through 1997 would amount to 790 new peak hour trips, or 4,190 AM peak hour trips. These projections assumed high transit ridership and wider application of TSM programs.

Roadway Improvements for Cumulative Impact Analysis

A number of long-range planning projects are underway which would increase the capacity of Highway 101. In this study it was assumed that Highway 101 would be eight lanes wide plus auxiliary lanes throughout Novato, and six lanes wide in Sonoma County. This is consistent with the majority of the Highway 101 configurations being studied by the Highway 101 Corridor Committee and with the Draft Sonoma County General Plan Circulation Element which calls for six lanes on Highway 101 prior to the year 2005. It was also assumed that a high level of transit use would occur as projected in the Marin

Table 3.1.4-29

TRIP DISTRIBUTION - OTHER NEARBY NOVATO

Hamilton Field Traffic Impact Study

<u>ORIGIN/DESTINATION OF TRIPS GENERATED IN STUDY AREA</u>	<u>PERCENT DISTRIBUTION</u>
Northern Segment of Highway 101	25
Southern Segment of Highway 101	35
Highway 37	10
Hamilton Field/East of Highway 101	14
Novato via Sunset Parkway/ Palmer Drive Extension	10
Internal Trips	<u>6</u>
TOTAL	100

Source: Wilbur Smith and Associates, 1986.

Highway 101 Corridor Study. The type of vehicles used on the transitway has yet to be decided. HOV lanes are also being considered as an alternative to a transitway.

On local streets, the only improvement assumed was the widening of the Marinwood Interchange to a 4-lane cross section.

Cumulative Impacts Without Project

Figure 3.1.4-8 and Tables 3.1.4-31 and 3.1.4-32 depict the impact of cumulative traffic on U.S. 101 and local streets without the Hamilton Field project in the year 1997. These impacts are discussed below.

Impacts on Highway 101. Non-project traffic is expected to increase by approximately 1,200 vehicles during the morning peak hour to the south of the Hamilton Field site by the year 1997. North of the site, this increase is projected at approximately 990 vehicles between Hamilton Field and Highway 37, and 790 vehicles north of the Sonoma County line. In the PM peak, the projected increase in non-project traffic by 1997 is slightly less than AM peak growth except for the segment north of the Sonoma County line, where the increase in PM peak traffic will be approximately the same as the increase in AM peak traffic, or 790 vehicles. During the AM peak, traffic will be well within the assumed capacity for 1997. During the PM peak period, demand is not projected to exceed Year 1997 capacity at the screenline points.

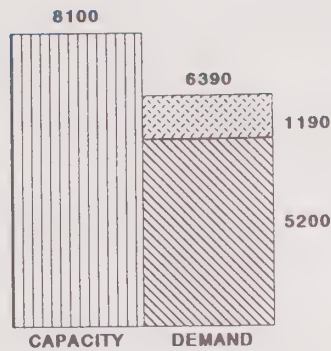
Projected impacts of non-project traffic in 1997 on Highway 37 are well within the capacity of that facility.

Impacts on Surface Streets. Tables 3.1.4-30 and 3.1.4-31 list volume/capacity ratios and levels of service for 1997 traffic without the Hamilton Field project at intersections involving freeway ramps and intersections involving only local streets, respectively. As can be seen, with cumulative traffic only, intersections would generally operate at levels of service similar to those projected for the project without cumulative traffic (i.e., impacts of cumulative traffic are approximately equal to those of project traffic at non-freeway locations).

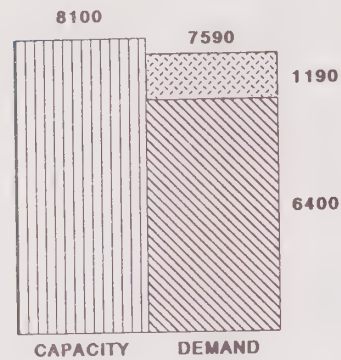
It is also important to note that the impacts at the Marinwood interchange are based on traffic modeling for the San Rafael General Plan. There it was assumed that McInnis

SOUTH OF ALAMEDA DEL PRADO

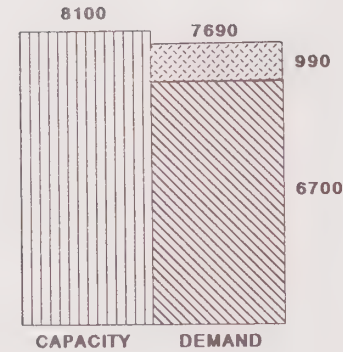
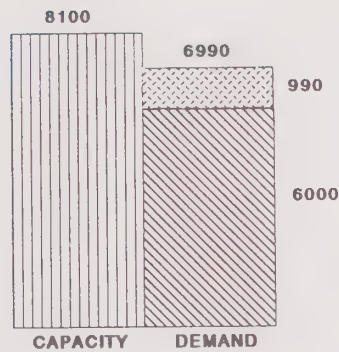
AM PEAK HOUR VEHICLE TRIPS
(SOUTHBOUND)



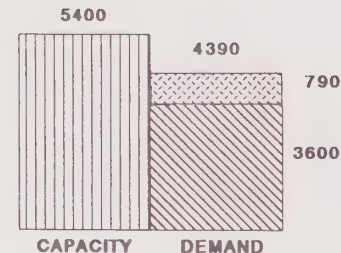
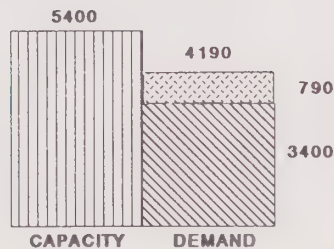
PM PEAK HOUR VEHICLE TRIPS
(NORTHBOUND)



BETWEEN IGNACIO AND S.R. 37



NORTH OF COUNTY LINE



CUMULATIVE



EXISTING

HAMILTON FIELD
MASTER PLAN
EIR

U.S. 101 IMPACTS
CUMULATIVE TRAFFIC
WITHOUT PROJECT
(YEAR 1997)



FIGURE 3.1.4-8

Table 3.1.4-30

FUTURE INTERSECTION LEVELS OF SERVICE
CUMULATIVE TRAFFIC WITHOUT PROJECT
HIGHWAY 101 RAMPS

<u>Intersection</u>	<u>Morning Peak Hour</u>		<u>Evening Peak Hour</u>	
	<u>Volume- Capacity Ratio</u>	<u>Level of Service</u>	<u>Volume- Capacity Ratio</u>	<u>Level of Service</u>
Ignacio Blvd/Southbound Ramps	1.04	F	0.77	C
Enfrente Blvd./Southbound Off-ramp	0.85	D	0.65	B
Ignacio Blvd/Northbound On-ramp (and Nave Drive)	0.97	E	1.19	F
Nave Drive/Northbound Ramps (Northern Ramps)	0.64	B	0.81	D
Alameda Del Prado/Southbound Ramps	0.59	A	0.39	A
Nave Drive/Northbound Ramps (Southern Ramps)	0.30	A	0.42	A
Miller Creek Rd./Northbound Ramps	0.80	C/D	0.85	D
Miller Creek Rd./Southbound Ramps	0.80	C/D	0.85	D
DeLong Ave./Southbound Ramps	0.72	C	0.53	A
DeLong Ave./Northbound Ramps	0.23	A	0.66	B
Rowland Blvd./Southbound Ramps	0.56	A	0.49	A
Rowland Blvd./Northbound Ramps	0.32	A	0.53	A

Note: Assumes project roadway improvements are not constructed

Source: Wilbur Smith Associates, May 24, 1988

Table 3.1.4-31

**FUTURE INTERSECTION LEVELS OF SERVICE
CUMULATIVE TRAFFIC WITHOUT PROJECT
SURFACE STREETS**

<u>Intersection</u>	<u>Morning Peak Hour</u>		<u>Evening Peak Hour</u>	
	<u>Volume- Capacity Ratio</u>	<u>Level of Service</u>	<u>Volume- Capacity Ratio</u>	<u>Level of Service</u>
Ignacio Blvd./Sunset Pkwy.	0.62	B	0.47	A
Ignacio Blvd./Alameda del Prado	0.68	B	0.63	B
Alameda Del Prado/Clay Ct.	0.32	A	0.45	A
Olive Ave./Redwood Rd.	0.51	A	0.61	B
Atherton Ave/Olive Ave.	0.46	A	0.52	A
DeLong Ave./Redwood Rd.	0.52	A	0.59	A/B
S. Novato Blvd/Grant Ave.	0.36	A	0.37	A
S. Novato Blvd./San Marin Dr.	0.48	A	0.46	A
S. Novato Blvd./Sunset Pkwy.	0.57	A	0.54	A
Nave Dr./State Access Rd.	0.52	A	0.52	A
Nave Dr./Main Gate Rd.	0.28	A	0.49	A
Nave Dr./New Entrance Rd.	NA	NA	NA	NA
Nave Dr./Bolling Rd.	0.36	A	0.49	A

Note: Assumes project roadway improvements are not constructed

Source: Wilbur Smith Associates, May 24, 1988

Table 3.1.4-32

FUTURE INTERSECTION LEVELS OF SERVICE
CUMULATIVE PLUS PROJECT TRAFFIC
HIGHWAY 101 RAMPS

<u>Intersection</u>	<u>Morning Peak Hour</u>		<u>Evening Peak Hour</u>	
	<u>Volume- Capacity Ratio</u>	<u>Level of Service</u>	<u>Volume- Capacity Ratio</u>	<u>Level of Service</u>
Ignacio Blvd/Southbound Ramps	0.54	A	0.56	A
Enfrente Blvd./Southbound Off-ramp ¹	0.95	E	0.75	C
Ignacio Blvd/Northbound On-ramp (and Nave Drive)	0.83	D	0.85	D
Nave Drive/Northbound Ramps (Northern Ramps)	0.83	D	0.85	D
Alameda Del Prado/Southbound Ramps	0.76	C	0.80	C/D
Nave Drive/Northbound Ramps (Southern Ramps)	0.48	A	0.69	B/C
Miller Creek Rd./Northbound Ramps ²	0.88	D	0.90	D/E
Miller Creek Rd./Southbound Ramps ²	0.88	D	0.90	D/E
DeLong Ave./Southbound Ramps	0.75	C	0.61	B
DeLong Ave./Northbound Ramps	0.33	A	0.75	C
Rowland Blvd./Southbound Ramps	0.59	A/B	0.57	A
Rowland Blvd./Northbound Ramps	0.35	A	0.61	B

¹ See Page 3-192 for a discussion of possible mitigation measures.

² Projected levels of service at this intersection were based on a San Rafael General Plan build out scenario, which assumed an eastside arterial. The Hamilton Field traffic projections did not assign traffic to an eastside arterial. If the eastside arterial were built, levels of service would improve. See also the discussion on Page 3-184.

Source: Wilbur Smith Associates, May 24, 1988

Parkway could be constructed (the San Rafael segment) and the overpass would be widened.

Cumulative Impacts With Project

Figure 3.1.4-9 and Tables 3.1.4-32 and 3.1.4-33 depict the impact of cumulative traffic on U.S. 101 and local streets with the Hamilton Field project in the year 1997. These impacts are discussed below.

Impacts on Highway 101. Cumulative traffic plus Hamilton Field traffic is expected to bring an increase of approximately 1,910 vehicles during the morning peak hour to the south of the Hamilton Field site by the year 1997. North of the site, this increase is projected at approximately 2,130 vehicles between Hamilton Field and Highway 37, and 1,640 vehicles north of the Sonoma County line. In the PM peak, the projected increase in non-project and Hamilton Field traffic combined is approximately the same as AM peak growth. During the AM peak, traffic will exceed the assumed capacity of 8,100 vehicles per hour between State Park 37 and Ignacio Boulevard.

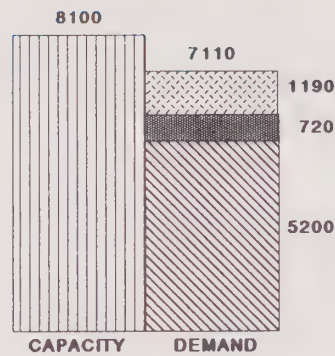
During the PM peak period, demand is projected to exceed Year 1997 capacity at two of the screenline points south of the site and between Ignacio Boulevard and State Route 37. The heaviest impacts of cumulative plus project traffic would be felt north of the Sonoma County line, where the demand would exceed the capacity by approximately 2,000 vehicles.

Projected impacts of project plus cumulative traffic in 1997 on Highway 37 are within the capacity of that facility.

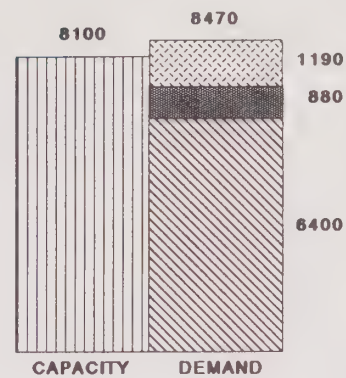
Impacts on Surface Streets. As shown in Tables 3.1.4-33 and 3.1.4-34, impacts on surface streets of cumulative traffic combined with project traffic will be only slightly greater than those of project traffic alone, with two locations experiencing degradation below desirable levels of service due to the combined effects of these two sources of future traffic. The two locations where this occurs are the Miller Creek/Highway 101 interchange and at the intersection of the Highway 101 southbound offramp at Enfrente Drive.

SOUTH OF ALAMEDA DEL PRADO

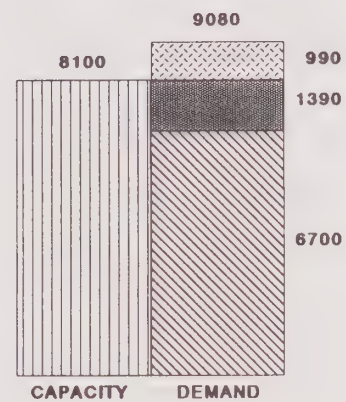
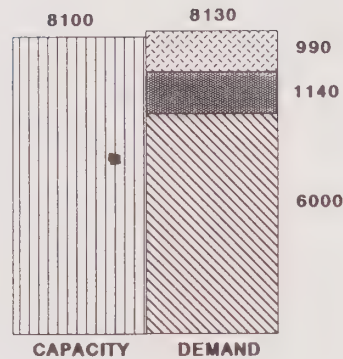
AM PEAK HOUR VEHICLE TRIPS
(SOUTHBOUND)



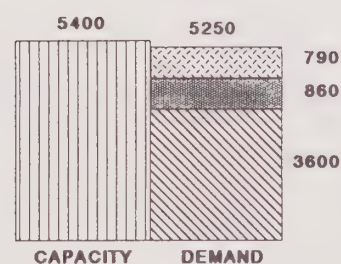
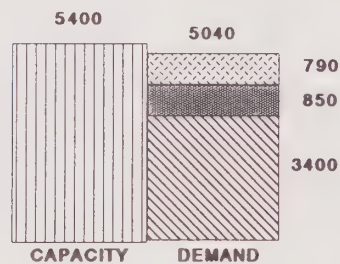
PM PEAK HOUR VEHICLE TRIPS
(NORTHBOUND)



BETWEEN IGNACIO AND S.R. 37



NORTH OF COUNTY LINE



 HAMILTON
  EXISTING
  CUMULATIVE

HAMILTON FIELD
MASTER PLAN
EIR

U.S. 101 IMPACTS
CUMULATIVE TRAFFIC
WITH PROJECT
(YEAR 1997)



FIGURE 3.1.4-9

Table 3.1.4-33

FUTURE INTERSECTION LEVELS OF SERVICE
 CUMULATIVE PLUS PROJECT TRAFFIC
 SURFACE STREETS

<u>Intersection</u>	<u>Morning Peak Hour</u>		<u>Evening Peak Hour</u>	
	<u>Volume- Capacity Ratio</u>	<u>Level of Service</u>	<u>Volume- Capacity Ratio</u>	<u>Level of Service</u>
Ignacio Blvd./Sunset Pkwy.	0.67	B	0.52	A
Ignacio Blvd./Alameda del Prado	0.75	C	0.70	B/C
Alameda Del Prado/Clay Ct.	0.58	A	0.68	B
Olive Ave./Redwood Rd.	0.61	B	0.72	C
Atherton Ave/Olive Ave.	0.51	A	0.73	C
DeLong Ave./Redwood Rd.	0.62	B	0.72	C
S. Novato Blvd/Grant Ave.	0.46	A	0.48	A
S. Novato Blvd./San Marin Dr.	0.57	A	0.55	A
S. Novato Blvd./Sunset Pkwy.	0.67	B	0.80	C/D
Nave Dr./State Access Rd.	0.70	B/C	0.68	B
Nave Dr./Main Gate Rd.	0.67	B	0.72	C
Nave Dr./New Entrance Rd.	0.48	A	0.75	C
Nave Dr./Bolling Rd.	0.56	A	0.61	B

Source: Wilbur Smith Associates, May 24, 1988

TABLE 3.1.4-34

AM PEAK HOUR
TRAFFIC DISTRIBUTION
AT A SCREEN-LINE SOUTH OF HIGHWAY 37
YEAR 1997
NOVATO HIGHWAY 101/37 PRS TRAFFIC STUDY

IMPROVEMENT SCENARIO (1)	SEGMENT CARRYING <u>DEMAND</u>	AM PEAK HOUR TRAFFIC VOLUMES IN NORTHBOUND DIRECTION						TOTAL CAPACITY	TOTAL CAPACITY	SURPLUS (DEFICIENCY)
		HAMILTON FIELD <u>PROJECT</u>	OTHER CUMULATIVE <u>GROWTH</u>	<u>EXISTING</u>	<u>SUB-TOTAL</u>	<u>TOTAL</u>	<u>CAPACITY</u>			
1. Without Mc Innis Without Transitway	Highway 101	1,396	990	6,000	8,823	8,386	8,100	8,100		(286)
2. With Mc Innis Without Transitway	Highway 101	778	890	5,100	7,163		8,100			
	Mc Innis Pkwy	618	100	900	1,661	8,823	1,500	9,500		677
3. Without Mc Innis With Transitway	Highway 101	1,230	879	5,686	8,184		8,100			
	Transitway	166	111	314	640	8,823	960	9,080		257
4. With Mc Innis With Transitway	Highway 101	722	803	4,904	6,804		8,100			
	Mc Innis Pkwy	508	113	900	1,551		1,500			
	Transitway	165	74	197	469	8,823	960	10,560		1,737

Notes:

(1) Assumes: Highway 101 is built to an eight lane freeway with auxillary lanes.

Mc Innis Parkway would be a four lane arterial between Civic Center Drive and Rowland Drive.

The transit would run buses at 5 to 10 minute headways with a capacity of 40 to 80 passengers per bus.

The projections at the Marinwood interchange (Miller Creek Road) are based on traffic forecasts for the San Rafael General Plan (which did not include traffic generated outside of San Rafael) plus the estimated impacts of the Hamilton Field traffic. The San Rafael analysis assumed that an eastside arterial would be built. The Hamilton Field analysis did not. The San Rafael General Plan analysis assumed that the Marinwood interchange would be widened to a four-lane cross-section, keeping the current diamond configuration. The McInnis arterial would improve the level of service at this intersection. A partial cloverleaf (par-clo) configuration of this interchange would substantially improve levels of service at the interchange.

MITIGATION MEASURES

PROPOSED PROJECT

As discussed in a previous section, the proposed project with cumulative traffic would introduce increases in peak hour traffic which would lead to unacceptable levels of service at certain locations. When cumulative traffic is factored in, almost all segments of Highway 101 would be burdened with above-capacity traffic demand, as would some surface street intersections unless a number of planned improvements are implemented. It should also be noted that cumulative traffic alone will bring some segments of U.S. 101 up to or over capacity during the 1997 study period.

US 101

If no improvements are made to Highway 101, analysis indicates that project traffic impacts will result in over-capacity conditions on Highway 101 north of the Sonoma County line, and virtual at-capacity conditions during the PM peak hour for northbound traffic on U.S. 101 between the project site and Highway 37. With the addition of cumulative traffic from other projects in the area, plus growth in through traffic, all segments of 101 in the vicinity of the project will have traffic demands in excess of capacity. It should also be noted that several "bottlenecks" exist on Highway 101 to the south, outside the study area, which will be negatively impacted by any new traffic, whether from project or non-project sources.

Year 1997 improvements to Highway 101 in Marin County assumed in the analyses in this report are virtually the same as those presented recently by the Highway 101 Corridor Study group as part of two alternative recommended programs, i.e., eight lanes of travel on Highway 101. Thus, the need for these improvements is evident for this portion of the study area.

North of the Sonoma County line, the 101 Corridor Study recommended widening 101 to six lanes which is also consistent with the Sonoma County Draft General Plan Circulation Element. This cross section would enable project plus existing and cumulative traffic to operate at acceptable levels of service, assuming a high level of transit service. An additional lane on Highway 101 in each direction in Sonoma County (i.e., an eight-lane cross section plus auxiliary lanes would provide peak hour peak direction capacity of 8,100 vehicles, enough to easily accommodate project plus cumulative traffic without improvements to transit service.

Tables 3.1.4-34 and 3.1.4-35 display the results of an analysis which was undertaken of the mitigating effects of a northern connecting roadway (McInnis Parkway) during both AM and PM peak periods. The analysis assumed that McInnis Parkway would be a limited access facility on a reasonably straight alignment with good operating speeds. Although different cumulative assumptions were used, combined with a transitway on the NWPRR right-of-way, a four-lane McInnis Parkway would mitigate the combined impacts of project plus cumulative development, without TSM. Because such a facility would not be likely to extend into Sonoma County, widening 101 to 8 lanes in that portion may also be necessary, without transit improvement.

Although the precise location for a northern connecting roadway has yet to be determined, it is currently the study of a multi-jurisdictional committee being undertaken by Marin County, the City of San Rafael, and the City of Novato. Four alignment alternatives are currently being studied, all of which would have similar beneficial effects. These alternative alignments within the site are discussed below.

Because the most realistic TSM measures suitable for the proposed project have been incorporated into the Master Plan for the project, additional TSM mitigations are not considered here. However, some benefits are to be expected if strong TSM measures are required to be applied to other potential projects in the area.

Highway 37

Highway 37 currently operates at half its capacity, and possesses sufficient reserve capacity to accommodate both projected Hamilton Field traffic and cumulative traffic from other sources on its mainline segments. However, substandard geometrics at its interchange with Highway 101 and at the Marsh Drive interchange pose potential problems for future traffic.

TABLE 3.1.4-35

PM PEAK HOUR
TRAFFIC DISTRIBUTION
AT A SCREEN-LINE SOUTH OF HIGHWAY 37
YEAR 1997
NOVATO HIGHWAY 101/37 PRS TRAFFIC STUDY

IMPROVEMENT SCENARIO (1)	SEGMENT CARRYING DEMAND	PM PEAK HOUR TRAFFIC VOLUMES IN NORTHBOUND DIRECTION				TOTAL CAPACITY	TOTAL CAPACITY	SURPLUS (DEFICIENCY)	
		HAMILTON	OTHER	EXISTING	SUB-TOTAL				
		FIELD PROJECT	CUMULATIVE GROWTH						
1. Without Mc Innis Without Transitway	Highway 101	1,699	1,088	6,700	9,487	9,487	8,100	8,100	(1,387)
2. With Mc Innis Without Transitway	Highway 101	971	979	5,960	7,910		8,100		
	Mc Innis Pkwy	728	110	740	1,578	9,488	1,500	9,600	112
3. Without Mc Innis With Transitway	Highway 101	1,492	959	6,276	8,727		8,100		
	Transitway	208	129	424	761	9,488	960	9,060	(428)
4. With Mc Innis With Transitway	Highway 101	902	882	5,430	7,214		8,100		
	Mc Innis Pkwy	590	120	1,005	1,715		1,500		
	Transitway	208	86	265	559	9,488	960	10,560	1,072

Notes:

(1) Assumes: Highway 101 is built to an eight lane freeway with auxillary lanes.

Mc Innis Parkway would be a four lane arterial between Civic Center Drive and Rowland Drive.

The transit would run buses at 5 to 10 minute headways with a capacity of 40 to 80 passengers per bus.

At the Highway 37 interchange with U.S. 101, westbound traffic destined for Novato Boulevard must merge with 101 off-ramp traffic destined for the same location on a bridge over Highway 101. This weaving section is of substandard length. At present, this configuration causes problems infrequently, due to the relatively low levels of U.S. 101 off-ramp traffic at this location, but future traffic increases will aggravate this problem. The Marsh Drive/Highway 37 intersection ramps are also of substandard length. At present, the relatively light traffic on Marsh Road poses no problem for the ramp intersections, but if future improvements, such as a McInnis Parkway, introduce more traffic, this interchange will become a bottleneck.

The redesign of both the U.S. 101/State Route 37 interchange and the Route 37/Marsh Drive interchanges are currently under study by CalTrans. A series of alternative concept designs have been prepared from which a final design will be selected. Each of the alternatives would eliminate the deficiencies at both interchanges, thus forestalling future problems at these locations.

McInnis Parkway

Four alternative alignments were examined within the Hamilton Field site for a possible alignment of the proposed east side arterial. These approximate alignments are diagrammed in Figure 3.1.4-10. The impacts of each alignment are discussed in this subsection.

The ultimate configuration of the eastside roadway was assumed to be a four-lane arterial. This is consistent with the planning assumptions of the San Rafael General Plan and would be needed according to planning studies of the internal circulation of Hamilton Field. The primary function of the street would be to carry local traffic in northern San Rafael and southern Novato. The eastside arterial may, however, be initially constructed as a two-lane road, depending on growth rates in Marin County.

Because there are currently no local streets connecting Novato and San Rafael in the vicinity of Highway 101, the eastside roadway would serve to reduce existing flows on Highway 101 since local trips would no longer require driving on Highway 101. Another advantage of the eastside road would be that it could provide an alternate route out of the Bel Marin Keys area.



HAMILTON FIELD MASTER PLAN EIR

APPROXIMATE McINNIS PKWY ALIGNMENT ALTERNATIVES

FIGURE 3.1.4-10

3-194

SOURCE: WILBUR SMITH ASSOCIATES



Route Alternative 1. This alternative has the advantage of avoiding pedestrian and vehicular conflicts in the Hamilton Field center of activity. It would allow for a connection to Bel Marin Keys Boulevard away from the congested Ignacio Boulevard/Highway 101 interchange. This alignment has the disadvantage of being a less direct route. The bends and curves in this alignment would provide a less convenient passage through the site compared to alternatives 2 and 3, but would be superior in this aspect compared to Alternative 4.

Route Alternative 2. This alignment would be more direct than Alternatives 1 or 4. It also has the advantage of moving access to Bel Marin Keys Boulevard away from the Ignacio Boulevard/Highway 101 interchange. This route, however, would bisect the project, which would increase pedestrian conflicts and congestion in the center of activity.

Route Alternative 3. This alignment would be difficult to implement primarily because of the location of the route's intersection with Bel Marin Keys Boulevard. In order to accommodate traffic movements at this new intersection, a major redesign of the Ignacio interchange may be needed. Otherwise a high degree of congestion would be expected at the new intersection. This alignment also fails to provide an alternate escape route from the Bel Marin Keys area. The advantage of this alignment is that it would be straight, which typically means that it would be quicker and more convenient for through traffic.

Route Alternative 4. This alignment is a variation on Alternative 1. It has the advantages of Alternatives 1 and 2 in that it will facilitate a connection to Bel Marin Keys Boulevard at a more desirable location than Alternative 3. It would not, however, provide convenient access to the Hamilton Field project. It is also a less direct route than the other alternatives. Finally, it is unclear if this route would be feasible due to conflicts with aviation activities.

Selecting an Alternative Alignment

Route Alternative 3 could be rejected because of the congestion problem it would create at the Ignacio Boulevard interchange and Route Alternative 4 could be rejected because it is an indirect route for through traffic and it would have limited connections to the development site. Alternatives 1 and 2 appear to be the most promising. Route

Alternative 1 would be the most beneficial from a site-planning point of view. It provides access to the development without breaking up the development. Route Alternative 2 appears to be the most beneficial from a subregional perspective, provided that the route through the center of the project would not create excessive delays at intersections.

Local Intersections and Site Access

Based on an EIR traffic analysis undertaken for an earlier plan for Hamilton Field, the current Master Plan incorporates project-related transportation improvements to local intersections and freeway ramps. These improvements were designed to enable all intersections to operate at a mid-"D" Level of Service (volume/capacity ratio of 0.85 or lower) with project plus cumulative traffic, and assuming the TSM reductions described in an earlier section of this report (but without a NWPRR transitway or McInnis Parkway). Analysis reveals that the proposed improvements for these intersections (as described in the section labeled "Project Traffic and Transportation Features" in this report) will achieve this goal for all except one intersection in the project vicinity. This intersection, the southbound Highway 101 Ramps/Enfrente Drive intersection, is projected to operate at Level of Service "E", with a volume/capacity ratio of 0.95 in the AM peak.

Enfrente Drive/SB 101 Off-Ramp Mitigation. Two alternative improvements were developed which would be capable of mitigating the impacts at this intersection. The first alternative would involve modifying the southbound ramps so that Enfrente Drive would not intersect them. The southbound straight-ramp would be separated from Enfrente Drive and would form a new intersection at Ignacio Boulevard. In order to accommodate traffic at acceptable levels of service, a traffic signal would be needed at the new intersection, the southbound loop-ramp should be widened to two lanes, and a fourth eastbound lane would be needed across Ignacio Boulevard. Preliminary design studies have shown that this would be feasible.

An alternative solution would be to install a traffic signal at the intersection of Enfrente Drive and the Southbound Highway 101 off-ramp and then widen the off-ramp to two-lanes. The ramp may require lengthening in order to hold queues on the ramp without overflowing onto the freeway.

The Ignacio/Enfrente intersection would then operate at LOS A in the AM peak, and LOS A in the PM peak with either improvement. The new intersection created by the relocated SB off-ramp at Ignacio Road would operate at LOS C in the AM peak, and LOS B in the PM peak.

Analysis also revealed that the Miller Creek Road intersections with U.S. 101 Northbound and Southbound ramps, further to the south, would operate at Level of Service "E" during the PM peak (V/C ratio of 0.90 at both intersections) when both project and cumulative traffic are included. These intersections are primarily impacted by cumulative traffic, which includes the assumption of full buildout under the San Rafael General Plan. This scenario includes development of the Silveira Ranch property and St. Vincent School site and an eastside arterial. A partial cloverleaf interchange configuration would improve levels of service to acceptable levels at this intersection.

Summary of Mitigation

The following planned or proposed highway and roadway improvements would be needed in order to accommodate cumulative traffic at acceptable levels of service in Year 1997 with the buildout of Hamilton Field. Included in the lists below are roadway improvements which would be needed to mitigate both project and cumulative traffic. The lists were broken into four categories:

1. Programmed Highway Improvements
2. Planned Hamilton Field Improvements
3. Additional Mitigation for Project-Related Impacts
4. Additional Planned Regional Improvements

Programmed Highway Improvements

In the study area, the extension of the Highway 101 HOV lanes between the Marinwood interchange to the State Route 37 interchange are programmed for the 1988/89 fiscal year. Outside the study area, a number of highway improvements are also programmed.

Planned Project Improvements

In addition to the planned internal roadway improvements which were not evaluated in this report, a number of local improvements would be needed to accommodate project

traffic. The improvements listed below include all roadway improvements which were assumed in evaluating the impacts of the project in the Impact section of this report. They are listed again here to clarify that these improvements would be needed with the Hamilton Field project. See also Figure 3.1.4-2.

- o A new northbound on-ramp would be built between Alameda del Prado and Ignacio Boulevard at the location of the existing off-ramp to Nave Drive and Roblar Drive would be realigned to intersect the Highway 101 ramps to the north. It should be noted that CalTrans has reviewed preliminary design studies. It was assumed that all new ramps would be built to CalTrans specifications, including adequate lengths for merging activity at acceptable levels of service. Further design studies are underway to determine right-of-way requirements and the ultimate physical feasibility of the project in conjunction with the planned HOV lane project.
- o A third main access road to the site would be constructed. This roadway would be four lanes wide (two lanes in each direction). Hereafter, this roadway is referred to as "New Entrance Road."
- o The Ignacio Boulevard overcrossing would be widened and/or restriped for one additional lane for eastbound movements to Hamilton Field. The left turn lane from Ignacio Boulevard to Northbound Highway 101 would be eliminated.
- o Traffic signals would be installed at the New Entrance Road, State Access Road, Main Gate Road and at the intersection of Alameda del Prado and Clay Court.
- o State Access Road would be widened to four lanes.
- o Nave Drive would be widened to a 5-lane cross section between State Access Road and Ignacio Boulevard. A design study is underway to determine right-of-way requirements, safety and the physical feasibility of this project.

Additional Mitigation for Project-Related Impacts

Several modifications to the planned Hamilton Field roadway improvements would be appropriate to accommodate project traffic. These modifications are listed below:

- o Traffic signals should be installed at all intersections on Nave Drive, including Bolling Drive.
- o A traffic signal should be installed at the intersection of Alameda del Prado and Clay Court.
- o The southbound Highway 101 ramp/Enfrente Drive intersection should be modified in one of two ways:

- The ramp should be moved so it does not intersect Enfrente Drive; the southbound loop ramp should be widened to two lanes; and the Ignacio Boulevard overpass should be widened to four lanes in the eastbound direction (see Figure 3.1.4-10); or
- The southbound straight-ramp and southbound Enfrente Drive should be widened to two lanes and a traffic signal should be installed at the intersection of Enfrente Drive and the southbound freeway ramp. The southbound ramp may require lengthening so that adequate storage is available to store queues without spilling over onto the mainline.

Additional Planned Regional Improvements

The key to accommodating any cumulative growth in Marin County hinges on the funding of major transportation improvements along the Highway 101 corridors. Funding for highway and/or transitway improvements appears to be dependent on the passage of a one-half cent sales tax in Marin County in the November, 1988 election and an additional one-half cent or full one cent sales tax in 1990.

The following improvements would be needed to accommodate Hamilton and cumulative traffic as projected for year 1997:

- o Eight lanes on Highway 101 between the site and the Atherton interchange plus auxillary lanes between interchanges.
- o Six lanes on Highway 101 north of the Atherton interchange plus an upgrading to full highway status.
- o Implementation of a transitway between Marin and Sonoma counties.

Other Mitigation

To assure responsible development, the following conditions were also proposed:

- o Provision of right-of-way and improvements within the project area commensurate with adopted general and specific plans for the McInnis Parkway. This mitigation would be subject to refinement based on the decision process which ultimately defines the McInnis corridor planning and financing program.
- o Responsibility for development of a plan and program for transportation impact fees in Marin and Sonoma Counties.
- o Guidelines to establish whether successful implementation of the TSM program is achieved in earlier phases of the project with provisions to reduce future development should goals not be achieved.

- o Clarification of the proposed transit contribution (\$1.00 per square foot) in terms of the year when the fee would be turned back over to the developer if no progress is made on the transitway and definitions of milestones which indicate progress.

Project Staging

In order to accommodate Hamilton Field traffic as well as existing traffic in problem areas, the following improvements would be needed on local streets before occupancy of the first phase of the project.

- o New right turn on Nave Drive on the northbound approach to the Ignacio Boulevard Intersection.
- o A new right turn lane on westbound Bel Marin Keys Boulevard.
- o A third eastbound lane on the Ignacio Boulevard Highway 101 overcrossing.
- o Construction of New Entrance Road (two-lane cross-section would be adequate at this time).

An alternative first phase of the project, which constitutes approximately 25% of the traffic generation would require these improvements without a new transit facility or TSM measures in place. The first two improvements should be completed before occupancy begins. The second two improvements would be needed at an intermediate point between zero occupancy and full occupancy of this alternative Phase I. The new northbound ramp would be needed at approximately 40% to 50% of buildout. The improvements to Nave Drive would be needed at this time as well. A full four-lane cross-section plus turn lanes would be required on Nave Drive.

A more detailed phasing study is currently underway which would address the construction timing of auxiliary lanes between Ignacio Boulevard and Alameda del Prado, as well as the relationship between project phasing and other improvements such as an NWPRR transitway (or alternative Hamilton Field transit service) and/or a McInnis Parkway.

ALTERNATIVE 1: DECREASED HOUSING, INCREASED JOBS

The transportation mitigation required for Alternative 1 would not differ from that required for the Project. With those mitigations the impacts of Alternative 1 on U.S. 101, the freeway ramps, and local streets would be mitigated to acceptable service levels.

ALTERNATIVE 2: DECREASED HOUSING, DECREASED JOBS

The transportation mitigation related to Alternative 2 would not differ substantially from that related to the project even though Alternative 2 would generate significantly less traffic than the Project. This is due to the fact that in many cases the need for mitigation is related to an existing problem, such as on U.S. 101, where even small increases in traffic trigger the need for the proposed mitigation.

ALTERNATIVE 3: INCREASED HOUSING, DECREASED JOBS

Alternative 3 would require the same mitigation as the project. Its total traffic generation and related impacts would be very similar to those of the project.

¹Draft Technical Memorandum No. 11, Travel Forecasts for Phase II Transportation Alternatives; Barton-Aschman Associates, October 1987.

²Conversation with Al Zahradnik, Golden Gate Transit.

SUMMARY COMPARISON OF IMPACTS AND MITIGATION MEASURES

3.1.4 TRAFFIC AND TRANSPORTATION

	IMPACT	MITIGATION
PROPOSED PROJECT	The proposed project would generate 66,100 daily trips. The greatest impact would occur during the PM peak hour in the northbound direction on Highway 101, where 1390 trips per hour would be generated on northbound Highway 101 between Ignacio Boulevard and State Route 37. The project would contribute substantially to needed local and regional transportation improvements.	The project sponsor should implement the planned TSM program and roadway improvements as well as other identified local roadway improvements or modifications. The right-of-way for a four-lane arterial (McInnis Parkway) should be reserved through the project that would be in alignment with the San Rafael Segment of the Parkway and would provide a feasible connection to the north. Provisions for a transit station on the NWPRR right-of-way would be maintained. Highway 101 widening would be necessary to the north of the site, although funding for Highway widening north of the State Route 37 interchange is uncertain. Finally, a plan should be developed to program for transportation impact fees in Marin and Sonoma Counties.
ALTERNATIVE 1: (Decreased Housing, Increased Jobs)	Alternative #1 would generate 66,500 daily trips. The greatest impact would occur during the PM peak hour in the northbound direction on Highway 101, where 1190 trips per hour would be generated on northbound Highway 101 between Ignacio Boulevard and State Route 37. Alternative #1 would contribute substantially to needed local and regional transportation improvements.	Mitigation would be the same as for the proposed project.
ALTERNATIVE 2: (Decreased Housing, Decreased Jobs)	Alternative #2 would generate 42,000 daily trips. The greatest impact would occur during the PM peak hour in the northbound direction on Highway 101, where 970 trips per hour would be generated on northbound Highway 101 between Ignacio Boulevard and State Route 37. Alternative #2 would contribute substantially to needed local and regional transportation improvements.	Mitigation would be the same as for the proposed project.
ALTERNATIVE 3: (Increased Housing, Decreased Jobs)	Alternative #3 would generate 62,800 daily trips. The greatest impact would occur during the PM peak hour in the northbound direction on Highway 101, where 940 trips per hour would be generated on northbound Highway 101 between Ignacio Boulevard and State Route 37. Alternative #3 would contribute substantially to needed local and regional transportation improvements.	Mitigation would be the same as for the proposed project.

3.1.5 PUBLIC SERVICES

INTRODUCTION

A number of agencies and jurisdictions will be involved in providing public services to Hamilton Field. The City of Novato provides police, public works, and parks and recreation services. The Novato Fire Protection District serves the City of Novato, Bel Marin Keys, and nearby unincorporated areas. The Novato Unified School District has responsibility for public education. The Marin County Free Library system serves the Novato area with a branch library. The Novato Disposal Service collects and disposes of solid waste.

The Hamilton Air Force Base currently provides some of its own services, while police services are provided by the Department of Defense through a contract with military authorities. The Novato Fire Protection District serves the Department of Defense family housing through a contract with the Navy. The City of Novato Police provide back-up services. The school, solid waste and library providers mentioned above also serve the Hamilton Air Force Base. Library services are provided to Lanham Village adjacent to the project site via a bookmobile.

The proposed project requires governmental jurisdictional reorganization. The Marin Local Agency Formation Commission (LAFCO) has prepared a report describing such changes.¹ LAFCOs are responsible for coordinating logical and timely changes in local governmental boundaries. The Commission's efforts are directed to ensuring that services are provided efficiently and economically, while protecting agricultural and open space lands. LAFCOs are also "mandated to establish spheres of influence for all cities and special districts."¹ The Marin LAFCO has "included the Hamilton Air Force Base site within the (urban) service area of the City of Novato, Novato Sanitary District, Novato Fire Protection District, and North Marin Water District. The boundary policy suggests that the private Hamilton Field property be annexed into these Special Service Districts."¹

The main factors which LAFCO considers in any city or special district boundary proposal are the following:

- o land area and land use;
- o proximity to other populated areas;

- o the likelihood of significant growth in the area;
- o the present cost and adequacy of governmental services and controls in the area;
- o the effect of the proposed action and of alternative actions on adjacent areas, on mutual social and economic interests, and on local government structure of the county (e.g. traffic);
- o conformity of the proposal with LAFCO policies;
- o consistency with city and county general and specific plans;
- o conformity with applicable city and special district spheres of influence.

Application for reorganization can only be made by the affected local agencies or by a property owner or registered voter in the affected area. LAFCO cannot initiate such boundary changes, but can only review and then approve or deny such proposals in light of the above factors and other LAFCO Policy Guidelines. The "reorganization process normally requires only three to four months from the date of submittal to LAFCO to recordation-completion."¹ As of January 1, 1986, reorganization procedure is governed by the Cortese-Knox Act. The procedure begins with the application. After an application is reviewed by LAFCO staff and all other affected agencies, a hearing is held before the LAFCO Commission and a determination on the application is made. If the application is approved, the next step is a public hearing before the Conducting Authority (the city or special district that will be annexing the property).

Following LAFCO policy in the case of the proposed project would involve the annexation of the site into the Novato Fire Protection District, the Novato Sanitary District (discussed in Section 3.1.6, Utilities), and the North Marin Water District. The public service impacts of doing so are discussed in the applicable subsections below.

FIRE

Setting

Fire protection for the City of Novato is provided by the Novato Fire Protection District. It operates four stations located at Grant Avenue and Redwood Boulevard, at South Novato Boulevard and Redwood Boulevard, at San Marin Drive and San Ramon Way, and on Enfrente Drive in the Ignacio area. Due to changes in service area needs the Grant

Avenue/Redwood Boulevard station is soon to be closed and the station at South Novato Boulevard/Redwood Boulevard will be moved to the Atherton area within a year. The District's service area includes the City of Novato, Bel Marin Keys, and unincorporated areas. It serves a population of approximately 55,000 residents and a built environment comprised of low-rise buildings.² In cooperation with other fire departments in Marin County, an expanded mutual aid program has been established providing additional personnel and equipment to serve Novato in the event of a large fire or emergency.³

The District supports 74 full-time fire fighters with an additional 20 volunteers available as needed.² This amounts to a general service level of 1.04 full-time firefighters per 1,000 worker/resident population. The District operates 6 fire engines, each capable of pumping at least 1,000 gpm, 1 tanker, 4 brush trucks, 3 ambulances, an 85-foot snorkel, and one paramedic rescue squad.² The project site is located within the Hamilton Air Force Base surplus properties which were de-annexed by the Novato Fire District in 1977. This reportedly occurred because of District concern that it could not support the costs of protection under the arrangements contemplated at the time. Currently, the Novato Fire District serves the entire Hamilton property under contract with the Department of Defense (DOD).⁴

The nearest station to the Hamilton Air Force Base is station No. 4, located on Enfrente Drive across the 101 Freeway. Response time to the base is approximately four minutes, although during peak-traffic periods serious delays have been encountered.⁵

Impacts

PROPOSED PROJECT

Following LAFCO Policy Guidelines discussed above, the Novato Fire Protection District would annex the site and serve the project. In general, the increased demand for fire protection services from the proposed project's residential and commercial development will "almost certainly require a new fire station at Hamilton plus new apparatus and increased staff."⁶ The District no longer uses a general service standard for estimating the impacts of new development, but instead analyzes each project's needs in detail based upon day and night population, type of land use, demographic characteristics, and other factors.⁶ Chief Berthinier has determined on a preliminary basis that one engine company would be needed to serve the project.⁶ The engine company would be staffed by three

firefighters 24 hours a day for a total of nine full-time firefighters. When a more specific project design is presented, further evaluation of the protection needs will be done.

Historically, the reliability of the water supply for fire fighting purposes has been poor.⁶ However, with the reconstruction of the entire water system so that it meets either NMWD or MMWD standards, water flow should meet fire fighting standards as well. The Master Plan's circulation system appears to provide sufficient access to and through the project. However, it does not provide access to adjoining developments. Connections to the Bel Marin Keys industrial park and residential area would improve emergency response times and essential secondary access and exit routes in case of emergency. The Fire District is also concerned about maintaining good access between the project and the military areas at Hamilton.⁶

It is likely that the new fire station and engine company would serve an area larger than the Hamilton project itself east of Highway 101. However, the precise service area cannot be determined until a more specific evaluation of the level of service required for Hamilton can be undertaken. This evaluation will be based on land use types, construction, fire flow and other considerations.

The project would also generate an off-site population increase and therefore, an associated increase in District-wide demand for service, due to employees who would take up off-site residence in the City of Novato and surrounding areas.

ALTERNATIVE 1: DECREASED HOUSING, INCREASED JOBS
 ALTERNATIVE 2: DECREASED HOUSING, DECREASED JOBS
 ALTERNATIVE 3: INCREASED HOUSING, DECREASED JOBS

The various levels of employment and population generated by the three alternatives would not alter the fact that a new fire station would need to be established on the project site.

Mitigation Measures

PROPOSED PROJECT

The project would include fully sprinkled buildings in both the rehabilitated and newly constructed office/R&D/commercial facilities. The project would include fire prevention

as well as suppression measures. All buildings will be built to current codes and ordinances to maximize safety and reduce fire protection costs.⁷ The Fire District should conduct an analysis of the present fire station located on the site to determine if it is suitable for rehabilitation. If not, another mutually acceptable site and facility should be identified. It is important that this facility fit into the project's overall masterplan. In addition, the project sponsor should provide a proportionate financial share of the cost of equipment and operation necessary for a one-engine company at the fire station. Other developments outside Hamilton served by the station should also contribute a proportionate share of these costs.

ALTERNATIVE 1: DECREASED HOUSING, INCREASED JOBS

ALTERNATIVE 2: DECREASED HOUSING, DECREASED JOBS

ALTERNATIVE 3: INCREASED HOUSING, DECREASED JOBS

Mitigation for the project as proposed would apply equally to Alternatives 1, 2 and 3.

POLICE

Setting

Police services in the City of Novato are provided by the City's own police department. The force consists of approximately 51 sworn personnel and 17.5 non-sworn personnel. Current service standards based upon the 1986 population of Novato (45,350) are 1.1 sworn personnel per 1,000 population, although the specific police protection needs for new development in the City are determined by a project's characteristics.

Police services on the project site are currently provided by Department of Defense (DOD) police on a contractual basis with military authorities. The City of Novato Police Department provides back-up services.

Impacts

PROPOSED PROJECT

With the implementation of the project, service to the site would be provided by the City of Novato Police Department. The level of service required has been addressed by Chief Charles S. Broleck:⁸

"To maintain the present staffing level of approximately one officer per 1,000 of population, it has been determined that eight of the nine additional persons would be sworn personnel. Failure to maintain this ratio would likely result in a reduced level of service to the public and increased concerns for officer safety.

"Six of the eight sworn personnel would be assigned to a new patrol area created specifically for the Hamilton Field area. Five officers and one corporal, providing service 24 hours a day, seven days per week, along with a patrol vehicle and related equipment.

"Due to the size of the project and the amount of traffic it will generate, the Department can reasonably anticipate having to significantly increase traffic enforcement and accident investigation activities in this area. Therefore, one position, preferably a sergeant, would be needed in the traffic section, along with the addition of a vehicle, probably a motorcycle.

"The remaining sworn position, perhaps a corporal, would be assigned to the investigations bureau. The size and characteristics of the project would generate a sufficient increase in the bureau's caseload to warrant the position and an unmarked vehicle.

"The ninth position would be needed to meet the increased demands for service placed on nonsworn support staff in the technical services bureau. Based on the demographics of the city, the current volume of calls for service, and the population and level of busienss activity associated with the proposed Hamilton project, calls for service are expected to rise by a minimum of 16%.

"The major impact of this increased workload will fall on the dispatchers. The addition of a beat and associated radio activity, coupled with an increase in emergency phone calls answered by dispatch, will require adding one additional dispatcher. This will allow for increased overlapping of dispatchers during peak workload hours. The department's current staffing level at the clerk/dispatcher position is adequate to handle the projected population increase for Hamilton.

"Other services provided by the department such as crime prevention and youth services would be impacted by the Hamilton project as well. It appears at this time, however, that the impact will not be sufficient to warrant expansion of current staffing levels in these bureaus.

"The recommended staffing levels relate directly to the Hamilton project. The development will undoubtedly have indirect impacts on law enforcement services outside of the project boundaries."

ALTERNATIVE 1: DECREASED HOUSING, INCREASED JOBS

ALTERNATIVE 2: DECREASED HOUSING, DECREASED JOBS

ALTERNATIVE 3: INCREASED HOUSING, DECREASED JOBS

The various levels of employment and population generated by the three alternatives would mean that a new police beat would need to be established at Hamilton Field.

Mitigation Measures

PROPOSED PROJECT

The project should include private security services, both electronic and patrol personnel to supplement public services. The traffic management system would decrease the need for public policing of traffic.⁷

ALTERNATIVE 1: DECREASED HOUSING, INCREASED JOBS

ALTERNATIVE 2: DECREASED HOUSING, DECREASED JOBS

ALTERNATIVE 3: INCREASED HOUSING, DECREASED JOBS

Mitigation for the project as proposed would apply equally to Alternatives 1, 2 and 3.

SOLID WASTE

Setting

The Novato Disposal Service serves the City of Novato and currently serves the project site as well. Solid waste is deposited at the Redwood Sanitary Landfill located four miles north of Novato between Highway 101 and the Petaluma River. The landfill's total area is 600 acres with 523 permitted for filling operations.⁹ The Redwood Sanitary Landfill receives material from the five collection systems serving residential and commercial waste generators in eastern Marin County, north of Corte Madera; a service area with a population of 158,020.¹⁰ It is a Class II & III site receiving a variety of solid waste: mixed municipal refuse, construction/demolition, sludge/septage, leaves/clippings, tires, and asbestos (a hazardous waste) since 1982.⁹ It was receiving 167,000 tons per year in 1984, with 291,200 projected for 2005 with no increase in recycling and 171,530 projected in 2005 if the 1990 recycling goals are achieved.¹¹

County-wide solid waste generation in 1984 amounted to 272,500 tons.¹² Of this total, 239,000 tons went into landfills County-wide,¹¹ while 33,500 tons were recycled. The Redwood Sanitary Landfill received 167,000 tons of the above total.¹¹ This represents roughly 70% of the total deposited in landfills County-wide in 1984. The final closing date for the landfill is expected sometime between 2010 and 2012, depending upon disposal volume and final capacity which are influenced by a number of factors: closing of other landfills, recycling rates, possible expansion of on-site fill acreage and elevations. The County has recommended in its Final Solid Waste Management Plan 1985-2005 that a siting study be undertaken to identify areas for future landfills. One site identified in the 1977 plan may be suitable but further investigation is required.¹³

The Novato Disposal Service served a 1984 population of 47,143, projected to increase to 58,954 by 2005.¹⁴ This represents approximately 21.5% of the total County-wide collection system population. The service area included 16,200 households and 685 commercial accounts in 1984, generating 25 truckloads per week or 21,000 tons per year for disposal and utilized an assortment of 21 trucks and 24 crew workers.¹⁵ A curbside recycling program is also offered at no additional charge to all customers.

Impacts

PROPOSED PROJECT

Table 3.1.5-1 below summarizes estimates of the project's solid waste generation at buildout in 1998. The project is estimated to generate approximately 17,425 tons per year of solid waste. This represents about 10% of the total received by the Redwood Sanitary Landfill in 1984. If the Redwood facility remains in operation beyond the year 2000, at an average annual rate of 170,000 tons per year, the cumulative waste generation from the Hamilton project would amount to less than one-and-a-half year's capacity. That is, the project would cause the filling and closing of the landfill about one-and-a-half years sooner than would otherwise occur.

County-wide projections of solid waste generation in the year 2000 amount to 321,400 tons per year (a 34% increase over 1984 total).¹¹ The project's solid waste would add 5.4% to this County-wide total in the year 2000.

ALTERNATIVE 1: DECREASED HOUSING, INCREASED JOBS

ALTERNATIVE 2: DECREASED HOUSING, DECREASED JOBS

ALTERNATIVE 3: INCREASED HOUSING, DECREASED JOBS

Alternative 1 would generate more solid waste than would the proposed project. By 1999, this alternative would create 18,800 tons of waste per year, or 5.8% of the projected county total. Alternative 1 would not materially change the life of the Redwood Sanitary Landfill, however, in comparison to the proposed project. It still would reduce the life of the landfill by about 1.2 years by 2005.

Alternatives 2 and 3 would both generate less solid waste than the proposed project, reaching 4.3% and 4.1%, respectively, of the countywide total by 1999. These alternatives would have less of an impact on the landfill, reducing its life by one year or less.

TABLE 3.1.5-1
SOLID WASTE GENERATION¹

<u>Source</u>	<u>Units</u>	<u>Factor (Avg. Tons/Yr)</u>	<u>Annual Total</u>
Employees	7,170	1.739	12,470
Residents	7,600	.652	<u>4,955</u>
Total Tons/Year			17,425

¹Units are EIP estimates. (Note that employment estimate excludes 130 employees moving over from Sutter Hospital in Novato.) Factors are from Marin County Planning Department, Draft Solid Waste Management Plan 1985-2005, pp. 2-7/8. Administrative Draft completed May, 1985.

Mitigation Measures

PROPOSED PROJECT

On-site recycling centers and resource recovery program feasibility will be included in the residential rental and commercial/industrial development areas at the precise plan level. Currently available curbside recycling service will be promoted by the Property Owners Association for all residential areas as established in the project's CC&Rs. Recycling efforts should strive to reach the County goal of 47% waste recovery. This would reduce the project's impact on the life of the Redwood Sanitary Landfill by about eight months.

ALTERNATIVE 1: DECREASED HOUSING, INCREASED JOBS
 ALTERNATIVE 2: DECREASED HOUSING, DECREASED JOBS
 ALTERNATIVE 3: INCREASED HOUSING, DECREASED JOBS

Mitigation for the project as proposed would apply equally to Alternatives 1, 2 and 3.

SCHOOLS

Setting

The Novato Unified School District (NUSD) serves the surrounding population with the Novato High School, the San Jose Middle School, and the Hamilton Elementary School. Current enrollments are 1,187 students (high school), 516 (middle school), and 660 (elementary school), with the following capacities at each school respectively: 1,456, 784, and 672.¹⁶ Enrollment has been declining as evidenced by the closing of 4 schools, although kindergarten enrollments have begun to increase again.¹⁷ The Hamilton Elementary School actually consists of two schools: Meadow Park and Hamilton. Meadow Park has a separate building located off of the current elementary school fenced property called the Meadow Park Annex. This is presently leased to the County Office of Education for another four years. No other buildings are present at the Hamilton School site.

The Marin Community College District has two campuses: the College of Marin in Kentfield and the Indian Valley College in Novato. The campuses currently have adequate classroom space for future growth, but are limited in their expansion capability by a State funding cap which restricts growth to 700 students per year.²³ The actual College District enrollments have reached or exceeded this cap in recent years.

Impacts

PROPOSED PROJECT

The project will generate an estimated student population of 630 elementary students, 120 middle school students and 210 high school students.¹⁸ This will have little effect on the middle school, will place the high school at capacity relative to existing enrollment levels, and will nearly double existing elementary school enrollment. Together with students from the proposed Navy housing and other projects in the vicinity, the school district anticipates the need for 30 additional classrooms equivalent to one-and-a-half new schools.

Additionally, an off-site population increase would be associated with the project and would stem from employees choosing to reside in the greater Novato area. This would also result in some increase in the demand for school services. Also, new legislation

which permits parents to enroll children where they work rather than where they live could have a major impact on Hamilton School enrollments, although the extent of this impact cannot be determined at this time.¹⁶

The project would also add 120 community college students to existing enrollments. These students would appear over a seven to eight year period as the project develops. But since the District is already reaching its 100 student per year cap with existing growth in development, these additional students could create an adverse impact.

ALTERNATIVE 1: DECREASED HOUSING, INCREASED JOBS
 ALTERNATIVE 2: DECREASED HOUSING, DECREASED JOBS
 ALTERNATIVE 3: INCREASED HOUSING, DECREASED JOBS

The amount of housing in each alternative bears directly on the number of school-age children they create. Alternative 1 generates 10% fewer elementary children than the proposed project, while Alternative 2 creates 40% fewer. A 40% reduction in the number of children decreases the need for new school facilities by about nine classrooms. Alternative 3 on the other hand adds 42 students to the elementary total, a 7% increase over the proposed project.

Mitigation Measures

PROPOSED PROJECT

The project sponsor and the school district have discussed several options for meeting the need for additional school facilities. Berg-Revoir Corporation will pay the school impact fees levied by the district under state law. The project sponsor proposed in the Master Plan to reserve a six-acre site for an additional school. However, under NUSD standards, this site is not large enough to accommodate a school. The district has raised the idea instead of obtaining two acres of Navy land adjacent to the existing school site for expansion purposes. The Hamilton Elementary School and the Meadow Park Annex could then function as two schools, one perhaps year-round to increase capacity without increasing facilities. The total size of the site with the two acres of Navy land would be about 9.5 acres per site, very near the desired 10 acres per school, and the use of shared facilities should make this site adequate. If the Navy site is unobtainable, the project sponsor should designate additional land toward a 10-acre site for a new school.

The project sponsor should encourage Hamilton employers to assist the Community College District in presenting related training programs on-site as a means of mitigating the financial impact of Hamilton on the District campuses.

ALTERNATIVE 1: DECREASED HOUSING, INCREASED JOBS

ALTERNATIVE 2: DECREASED HOUSING, DECREASED JOBS

ALTERNATIVE 3: INCREASED HOUSING, DECREASED JOBS

Mitigation for the project as proposed would apply equally to Alternatives 1, 2 and 3.

PARKS & RECREATION

Setting

The Parks and Recreation Department of the City is responsible for the planning and implementation of programs and facilities to meet the recreational needs of the community. There are a number of public parks and recreational facilities serving the Novato area including Miwok Park and Prehistory Museum, Pioneer Park, Arroyo Vivichi Park and Hoog Park. The City also maintains miniparks within the Bahia area, Partridge Knolls and The Woodlands.³

The City's developed park and playground facilities do not meet accepted standards, but the low density of development in the City and substantial areas of unimproved open space mitigate this problem.³ In addition, the Hamilton school sites contain some playground facilities,⁷ although these are not officially considered part of the City's stock of park and recreation resources.

Impacts

PROPOSED PROJECT

Current service standards call for 4 acres/1,000 dwelling units. The City's Residential Development Tax Ordinance (Section 9-20 of the Novato Municipal Code, pursuant to the provisions of the State Quimby Act) requires new developments to pay fees or dedicate land for public parks. At the above service standard, the project would need to provide 14.2 acres of parkland. The exact requirements for park dedications and in-lieu fees in connection with the project will be determined in the Development Agreement for the project, as provided in Section 9-20 of the Novato Municipal Code.

The project includes the dedication of a 5.6-acre parcel on Hangar Avenue contiguous to the military ballfields to be developed for sportsfields, including soccer and softball, two of which would be lighted for public use at night. The project plan reserves a 6-acre parcel for a school/park site on State Access Road. If the School District purchases the site for a school, it is anticipated that part of the parcel would be developed with playground and ballfield facilities. Such facilities could be used by day care facilities if located nearby. A public park on the top of Ammo Hill will provide a community picnicking site and volleyball courts. The total recreational/open space area on Ammo Hill is 22.9 acres. A public park on the top of Reservoir Hill, part of a 12.3-acre open space area, will provide walking and jogging trails and a field for play. The project also includes a bike and pedestrian pathway around the wetlands (23.9 acres) and the north side of Ammo Hill. Recreational jogging, hiking and bicycle paths will be provided throughout the project area.

The public parks and publicly staffed recreational programs for the project population will be augmented by the substantial private recreational facilities on lands dedicated to the City's planned for the project. Recreational common areas will be included within the residential use areas, including children's play areas and pools. The business use areas will also have recreational common areas for employees and visitors. The project sponsor is reserving acreage for a major private recreational facility composed of indoor and outdoor facilities, which would probably include a large swimming pool and tennis courts, and anticipates additional commercial recreational facilities depending on market demand. While such facilities would be geared primarily to people working or residing at Hamilton Field, community-wide memberships and opportunities for shared use of facilities by community teams are anticipated.

Construction of the public parks and their facilities on lands dedicated to the City will be provided by the City of Novato, with the project sponsor's in-lieu fees contributing to the cost of the construction. Public park areas within the project will be maintained and staffed by the City of Novato Parks and Recreation Department.

ALTERNATIVE 1: DECREASED HOUSING, INCREASED JOBS
ALTERNATIVE 2: DECREASED HOUSING, DECREASED JOBS
ALTERNATIVE 3: INCREASED HOUSING, DECREASED JOBS

Based on the City's formula for park acreage demand based on residential units, Alternative 2 would have a substantially lower demand of about eight acres, while Alternatives 1 and 3 would be very similar to the proposed project.

Mitigation Measures

PROPOSED PROJECT

The Hamilton Field Master Plan includes sufficient acreage to meet city parks standards, provided that at least 14 acres are developed as active park areas. The project sponsor should work with the City Recreation Department to prepare a detailed recreation plan that addresses the various kinds of recreational facilities needed for the project population. The specific proposals in the Master Plan pursuant to Novato Ordinance No. 11249 are listed below.

- o Hamilton Field Master Plan proposes to offer for dedication approximately 65 acres of open space. Open space areas will be offered for dedication to the Parks and Recreation Department, City of Novato. Approximately 23.5 acres of the open space are seasonal wetland and riparian habitats.
- o In lieu fees will be applied to park improvements including ball fields, volleyball courts, walking trails, vista kiosks, picnic areas and bench seating within the approximately 65 acres of open space as provided in Novato City Ordinance #11249.
- o The Revised Master Plan incorporates a privately owned recreation center in addition to the above improvements.

Residential neighborhoods will include open lawn areas, swimming pools and "tot lot" improvements at selected locations. Neighborhood open space improvement standards will be detailed for both for-sale and rental housing at the submittal of the Phase I Precise Plan.

ALTERNATIVE 1: DECREASED HOUSING, INCREASED JOBS
 ALTERNATIVE 2: DECREASED HOUSING, DECREASED JOBS
 ALTERNATIVE 3: INCREASED HOUSING, DECREASED JOBS

Mitigation for the project as proposed would apply equally to Alternatives 1, 2 and 3.

LIBRARY

Setting

Library services in Novato are provided by the Marin County Free Library. The Novato branch, completed in 1971 and currently the busiest branch in the County's library system, has 90,000 volumes and circulates approximately 290,000 volumes per year. The main reference library, located in the Marin Civic Center, has 125,000 additional volumes. Fiscal limitations of Prop 13 and 4 have resulted in a reduction of staff hours and book purchases. The library maintains a staff of 15 full- and part-time employees, supplemented with volunteer help.¹⁹

The California Library Association suggests a two books per capita standard for communities under 100,000. This standard is considered an absolute minimum. In Marin County, library usage tends to reach a rate of 3-5 books per capita,³ although the service that the library can currently provide in Novato is only 1.8 books per capita. A bookmobile service is provided to Lanham Village residents through the main library, and is considered an extremely busy stop on the bookmobile's route throughout the County.

Impacts

PROPOSED PROJECT

The project would add approximately 7,600 on-site residents to the Novato Branch Library's service population. At a minimum service level of two books per capita, the library would need about 15,200 volumes, with the employees at the project adding the need for an additional 3,800 books.²⁰

The Novato Branch library is quite a distance from the project site. Therefore, a branch library located on the project site or at least in the Ignacio area, is considered desirable by the County library staff. Such a facility would be approximately 8,000 gross square feet, seat 35 people, be able to hold 30,000 volumes, and be staffed with 1.5 librarians and 2 library clerks.²⁰ The library would serve other users in the project vicinity, but the precise service area has not been determined.

The off-site population increase from employees who choose to reside in the Novato area would also increase demand for library services.

ALTERNATIVE 1: DECREASED HOUSING, INCREASED JOBS
ALTERNATIVE 2: DECREASED HOUSING, DECREASED JOBS
ALTERNATIVE 3: INCREASED HOUSING, DECREASED JOBS

As with parks and schools, Alternative 2 would have a much lower impact than the proposed project or the other alternatives (Alternative 1 would require a lower number of books than would the project while alternative 3 would increase the number of books slightly). Alternative 2 would require about 9,000 books, but this would still create the need to locate a branch library at the site.

Mitigation Measures

PROPOSED PROJECT

The project sponsor should provide space for a library. One option would be providing leasable space in a rehabilitated building at reduced or nominal rents. The project sponsor has indicated that space would be available in the refurbished Fire Station, which the County library staff may wish to consider.

ALTERNATIVE 1: DECREASED HOUSING, INCREASED JOBS
ALTERNATIVE 2: DECREASED HOUSING, DECREASED JOBS
ALTERNATIVE 3: INCREASED HOUSING, DECREASED JOBS

Mitigation for the project as proposed would apply equally to Alternatives 1, 2 and 3.

STORM DRAINAGE

Setting

Hamilton Air Force Base is located in the major 44 square-mile watershed of Novato Creek. It is also subject to the hydrological effects of being located on the edge of, and in some cases at an elevation below the surface of, San Pablo Bay. As a result, the military has operated a storm drainage system for the drainage areas on the Base.

This drainage system, which is no longer in operation, consists of concrete-lined ditches and pumps which discharge into San Pablo Bay. The pump system is old and does not meet Occupational Safety and Health Act standards. In addition, a system of perimeter levees approximately seven feet above mean sea level (msl) keeps water from entering the airfield, much of which is below sea level and otherwise exposed to inundation by both

tidal waters of San Pablo Bay and storm runoff. The levees do not meet Corps of Engineers criteria for protection from a 100 year flood event and some areas are not protected by substantial levees.⁴

The Hamilton Field Project Area is subject to storm water runoff from three sources: Arroyo San Jose during overtopping of levees, Pacheco Creek, and on-site runoff. Those portions of the Hamilton Field Project lying below elevation 6 msl are potentially subject to flooding from San Pablo Bay, according to the 1984 Flood Insurance Rate Map for the area. The potential for flooding of the site exists as a result of levee and/or pump failure. Although major portions of the base are at elevations below sea level, and the levees have been over-topped by high tides, no available information indicates any developed portion of the base has been flooded by sea water since it was built. This is probably due to the large low lying ponding area east of the runway, and high capacity of the discharge pumps.

Overall, the existing drainage system within the master planned area is inadequate in capacity, in deteriorated condition, and in locations incompatible with other proposed improvements.

Impacts²¹

PROPOSED PROJECT

Please refer to Section 3.2.2, Hydrology for a detailed discussion of project storm drainage impacts. In general, the existing system will be replaced and that portion lying within Phase 1 lowered in elevation, as allowed by construction of the secondary retention basin in Phase I. Development Phase I proposes construction of a secondary retention basin north of Hangar Building #350. It would discharge into an existing 54-inch C.M.P. which drains under the Army runway to the existing pump stations. An additional pump station to increase capacity is proposed to be added to this system. A weir is proposed for construction in the levee separating Pacheco/San Jose Retention Basin and Hamilton Field runway area.

ALTERNATIVE 1: DECREASED HOUSING, INCREASED JOBS
 ALTERNATIVE 2: DECREASED HOUSING, DECREASED JOBS
 ALTERNATIVE 3: INCREASED HOUSING, DECREASED JOBS

Storm drainage impacts for the project as proposed would generally apply equally to Alternatives 1, 2 and 3.

Mitigation Measures**PROPOSED PROJECT**

The Department of Defense has the obligation to maintain to current standards the existing levee and pump station. To meet this obligation, the U.S. Army Corps of Engineers is sponsoring a study of the existing Hamilton Field levee system to determine what is required to bring the levee up to current standard. Several nearby properties are affected by the existing levee system including the Hamilton Field project; the Army and Navy facilities; the existing Bel Marin Keys development, Unit #5, and Industrial Park; the Saint Vincent's property and Pacheco Pond.

If the Department of Defense does not improve the existing levee system, the project sponsor proposes to construct a new dike east of Hangar Road to be approved by the Marin County Flood Control and Water Conservation District. The general location of the new dike is shown on Map #15 of the Revised Hamilton Field Master Plan. This dike will have removable sections allowing access from the hangars to the runway.

In addition, the project sponsor will construct a retention basin and pumps during Phase I north of Hangar Building #350 as shown on Map #15. The retention basin waters would discharge through an existing 54-inch diameter pipe which drains under the existing runway. The waters would then be pumped into San Pablo Bay via the existing pumps maintained by U.S. Army and Navy agencies.

The Hamilton Field Master Plan includes a proposal to construct a new diversion drainage channel along the north project boundary generally shared with the Los Robles Mobile Home Park. This improvement will benefit the Los Robles Mobile Home Park and will be constructed as approved by the Marin County Flood Control and Water Conservation Districts.

The project will provide internal storm water drainage infrastructure improvements in compliance with current City of Novato Development Standards Ordinance and direct the project generated flows either through the Pacheco Creek channel or via the Hangar Road area system to the off-site pumps and into San Pablo Bay. This improved system will not introduce significant increased urban runoff water into the area proposed for wetlands preservation and will closely match existing flow directions.

An Erosion Control Plan will be submitted to the City of Novato during each project phase's submittal of final improvement plans as required by the City's Development Standards Ordinance. Specific measures will consider the following:

- o Discharge runoff into small drainages, where possible, and at frequent intervals to avoid build-up of large, potentially erosive flows, and provide erosion protection at all discharge points.
- o Keep runoff where practicable away from disturbed areas during construction.
- o Trap sediments where practicable before they leave the site or each water course.

ALTERNATIVE 1: DECREASED HOUSING, INCREASED JOBS

ALTERNATIVE 2: DECREASED HOUSING, DECREASED JOBS

ALTERNATIVE 3: INCREASED HOUSING, DECREASED JOBS

Mitigation for the project as proposed would apply equally to Alternatives 1, 2 and 3.

¹Marin Local Agency Formation Commission. The Role of LAFCO as Applied to the Hamilton Air Base Reorganization, October, 1985. Additional notes: pp. 1,3.

²James Berthinier, Fire Chief, Novato Fire Protection District, personal communication, July 23, 1986. District service population estimated at 55,000 residents. Worker population of Novato estimated at 16,100: ABAG, Projections '85, July 1985, p. 106.

³City Of Novato, Final Environmental Impact Report For The Novato General Plan, Vol. 1, Certified September 29, 1981. pp. III-C-10/12, III-G-22,34,43.

⁴U.S. General Services Administration. Draft EIR On Disposition And Use Of Federal Surplus Property At Hamilton Air Base, Novato, California, April 1979, pp. 6/8, VI-50,147/8,150/1. Also, see letter from Chief Berthinier to Sandra Bonner, City of Novato, dated February 4, 1987.

⁵Berg-Revoir Corporation. Hamilton Field Master Plan, December 4, 1985, Project Description, pp.5,9.

⁶James Berthinier, Chief, Novato Fire Protection District, Letters to Novato Redevelopment Agency, Jan. 4, 1986 & June 4, 1986, and personal communication to the City of Novato, October 29, 1986. See also letter dated February 4, 1987 to Sandra Bonner, City of Novato.

⁷Op. cit., Berg-Revoir Corp. Master Plan, Environmental Data Submission, pp. 31,36.

- ⁸ Brian Bradey, Captain, Novato Police Department, personal communication, July 31, 1986 and Police Chief Charles Broleck, communication on October 29, 1986.
- ⁹ Marin County Planning Department, Final Solid Waste Management Plan, 1985-2005, August 1987.
- ¹⁰ Ibid, p. 4-14.
- ¹¹ Ibid, pp. 4-6/7.
- ¹² Ibid, p. 2-2, 2-8/9.
- ¹³ Ibid, p. 4-25.
- ¹⁴ Ibid, p. 3-9.
- ¹⁵ Ibid, p. 3-10.
- ¹⁶ Annette Conklin, Director of Public Information, Novato Unified School District, telephone conversation, January 29, 1988.
- ¹⁷ Ronald E. Franklin, Superintendent, Novato Unified School District, letter to Sandra Bonner dated February 26, 1987.
- ¹⁸ Novato Unified School District, Developer Fee Findings, May 15, 1987.
- ¹⁹ Doreen Emery, Reference Librarian, Marin County Free Library System, Civic Center Branch, personal communication, July 24, 1986.
- ²⁰ Alice McNamee, Assistant County Librarian, Marin County Free Library System, Civic Center Branch, personal communication, July 31, 1986.
- ²¹ City Of Novato Redevelopment Agency, Novato Redevelopment Survey Area No. 3. Hamilton Field and Related Properties, Condition Review and Cost Estimate, Prepared by Stuber-Stroeh Associates, Inc., July 1986.
- ²² Judy Foster, Assistant Superintendent, Novato Unified School District, personal communication, August 4, 1986.
- ²³ George A. Kozitya, Vice President Administrative Services, Marin Community College, telephone conversation, May 31, 1988.

SUMMARY COMPARISON OF IMPACTS AND MITIGATION MEASURES

3.1.5 PUBLIC SERVICES

1. FIRE	IMPACT	MITIGATION
PROPOSED PROJECT	The construction of 3,550 new housing units and 2.9 million square feet of business space will require that a new fire station be established at Hamilton Field.	The project sponsor should pay for a proportionate share of the equipment and operation necessary for one engine at the fire station. Redevelopment would allow for the rehabilitation of a site and new fire station at Hamilton.
ALTERNATIVE 1: (Decreased Housing, Increased Jobs)	A decrease in the amount of housing and an increase in the amount of space constructed for business will still require a new fire station at Hamilton Field.	Mitigation would be the same as for the proposed project.
ALTERNATIVE 2: (Decreased Housing, Decreased Jobs)	The construction of 2,000 new housing units and 2.87 million square feet of space for business development will still require that a new station be established at Hamilton Field.	Mitigation would be the same as for the proposed project.
ALTERNATIVE 3: (Increased Housing, Decreased Jobs)	More housing and less space for business development will still require the establishment of a new fire station at Hamilton Field.	Mitigation would be the same as for the proposed project.

SUMMARY COMPARISON OF IMPACTS AND MITIGATION MEASURES

3.1.5 PUBLIC SERVICES

2. POLICE	IMPACT	MITIGATION
PROPOSED PROJECT	The proposed project will require that a new police patrol be established at Hamilton Field requiring a staff increase of 8 sworn officers and one additional position.	The project sponsor should provide private security services to supplement public police services. A traffic management system should be established to decrease the need for public traffic policing.
ALTERNATIVE 1: (Decreased Housing, Increased Jobs)	The level of development proposed in Alternative #1 will still require the establishment of a new police beat at Hamilton Field.	Mitigation would be the same as for the proposed project.
ALTERNATIVE 2: (Decreased Housing, Decreased Jobs)	The level of development proposed in Alternative #2 will still require the establishment of a police beat.	Mitigation would be the same as for the proposed project.
ALTERNATIVE 3: (Increased Housing, Decreased Jobs)	The level of development proposed in Alternative #3 will still require the establishment of a new police beat.	Mitigation would be the same as for the proposed project.

SUMMARY COMPARISON OF IMPACTS AND MITIGATION MEASURES

3.1.5 PUBLIC SERVICES

3. SOLID WASTE	IMPACT	MITIGATION
PROPOSED PROJECT	The proposed project will generate 17,425 tons of solid waste per year, and add 5.4% to the 321,400 tons of solid waste projected to be generated in Marin County by 2000. Project will reduce the lifespan of the Redwood Sanitary Landfill by 1.5 years.	The project sponsor should establish an onsite recycling and resource recovery program. The County should plan for the establishment of new landfill that will accomodate growth after 2000.
ALTERNATIVE 1: (Decreased Housing, Increased Jobs)	Alternative #1 would generate more solid waste than the proposed project, and add 5.1% to Marin County's projected solid waste. Alternative #1 would reduce the lifespan of the Redwood Sanitary Landfill by 1.2 years.	Mitigation would be the same as for the proposed project.
ALTERNATIVE 2: (Decreased Housing, Decreased Jobs)	Alternative #2 would generate less solid waste than the proposed project, and add 3.9% to Marin County's projected solid waste. Alternative #2 would reduce the lifespan of Redwood Sanitary Landfill by one year or less.	Mitigation would be the same as for the proposed project.
ALTERNATIVE 3: (Increased Housing, Decreased Jobs)	Alternative #3 would generate less solid waste than the proposed project, and add 3.7% to the County's projected solid waste total. Alternative #3 would reduce the lifespan of the Redwood Sanitary Landfill by one year or less.	Mitigation would be the same as for the proposed project.

SUMMARY COMPARISON OF IMPACTS AND MITIGATION MEASURES

3.1.5 PUBLIC SERVICES

4. SCHOOLS	IMPACT	MITIGATION
PROPOSED PROJECT	The proposed project will have 3,550 new housing units and generate 630 additional elementary school students, creating the need for 21 additional classrooms, equivalent to one-new school. Cumulative development from Navy housing and Bel Marin Keys adds demand for 10 additional classrooms.	The project sponsor should amend the Master Plan to set aside a site for the construction of an additional school. The School District, City, and Project Sponsor should work together to plan for the temporary increased usage of existing schools.
ALTERNATIVE 1: (Decreased Housing, Increased Jobs)	Alternative #1 would have 3,250 new housing units and generate 570 rather than 630 new elementary children, creating the need for 19 additional classrooms.	Mitigation would be the same as for the proposed project.
ALTERNATIVE 2: (Decreased Housing, Decreased Jobs)	Alternative #2 would have 2,000 new housing units and generate 370 new elementary students, requiring 12 additional classrooms.	Mitigation would be the same as for the proposed project. The construction of a new school will be sufficient to accommodate the increased demand caused by Alternative #2. There is no need to plan for the increased usage of existing schools.
ALTERNATIVE 3: (Increased Housing, Decreased Jobs)	Alternative #3 would have 3,750 new housing units which will generate 672 new elementary students causing a demand for 22 additional classrooms.	The project sponsor should amend the Master Plan to set aside a site for the construction of an additional school. The School District, City, and project sponsor should work together to plan for the increased usage of existing schools.

SUMMARY COMPARISON OF IMPACTS AND MITIGATION MEASURES

3.1.5 PUBLIC SERVICES

5. PARKS & RECREATION	IMPACT	MITIGATION
PROPOSED PROJECT	The scale of the proposed project would create the need for 14.2 acres of new park and recreational facilities in accordance with existing City and State standards.	The project sponsor is required to meet the demand for new park space either through the Quimby Act fees or land dedication, and the project sponsor should work closely with the City Park Recreation Department to develop a satisfactory recreational plan for the site.
ALTERNATIVE 1: (Decreased Housing, Increased Jobs)	The scale of the proposed project would create the need for 14.2 acres of new park and recreational facilities in accordance with existing City and State standards.	Mitigation would be the same as for the proposed project.
ALTERNATIVE 2: (Decreased Housing, Decreased Jobs)	The smaller scale of Alternative #2 would create the need for 8 acres of new parks and recreation facilities.	Mitigation would be the same as for the proposed project.
ALTERNATIVE 3: (Increased Housing, Decreased Jobs)	The scale of Alternative #3 would create the need for approximately 14 acres of parks and recreation facilities.	Mitigation would be the same as for the proposed project.

SUMMARY COMPARISON OF IMPACTS AND MITIGATION MEASURES

3.1.5 PUBLIC SERVICES

6. LIBRARY SERVICES	IMPACT	MITIGATION
PROPOSED PROJECT	The proposed project would add approximately 7,600 persons to the population of Hamilton Field, creating the need for the Novato Branch of the Marin County Library System to acquire an additional 15,200 books, and open a branch library near the site.	The project sponsor should work with the County Library Staff to study the feasibility of donating a site for a new branch library, or leasing space at reduced rents that may be available in the refurbished fire station or another appropriate building.
ALTERNATIVE 1: (Decreased Housing, Increased Jobs)	Project Alternative #1 would add approximately 7,000 persons to the population of Hamilton Field, creating the need to acquire 14,000 new books, and open a branch library near the site.	Mitigation would be the same as for the proposed project.
ALTERNATIVE 2: (Decreased Housing, Decreased Jobs)	Project Alternative #2 would add 4,300 new persons to the population at Hamilton Field, creating the need to purchase 8,600 new books, and open a new branch library near the site.	Mitigation would be the same as for the proposed project.
ALTERNATIVE 3: (Increased Housing, Decreased Jobs)	Project Alternative #3 would add approximately 9,000 people to Hamilton Field's population, creating the need to acquire 18,000 additional books and open a branch library near the site.	Mitigation would be the same as for the proposed project.

SUMMARY COMPARISON OF IMPACTS AND MITIGATION MEASURES

3.1.5 PUBLIC SERVICES

7. STORM DRAINAGE	IMPACT	MITIGATION
PROPOSED PROJECT	The project will require the construction of a new storm drainage system to replace the antiquated system built by the military.	If the Department of Defense does not improved the existing levee systems, the project sponsor proposes to construct a new dike east of Hangar Road. Other system improvements include new retention basins, pump stations and a weir.
ALTERNATIVE 1: (Decreased Housing, Increased Jobs)	Impacts would be the same as for the proposed project.	Mitigation would be the same as for the proposed project.
ALTERNATIVE 2: (Decreased Housing, Decreased Jobs)	Impacts would be the same as for the proposed project.	Mitigation would be the same as for the proposed project.
ALTERNATIVE 3: (Increased Housing, Decreased Jobs)	Impacts would be the same as for the proposed project.	Mitigation would be the same as for the proposed project.

3.1.6 UTILITIES

INTRODUCTION

As with public services described in the previous section, no single agency is responsible for all the utility services required at Hamilton Field. The North Marin Water District provides service to the Novato area exclusive of the Hamilton Air Force Base which is served presently by the Marin Municipal Water District (MMWD). Sanitary services to the Novato area are provided by the Novato Sanitary District which also serves the Base through a contractual arrangement. PG&E serves the Novato area and the Hamilton Air Force Base. Phone service to the Novato area are provided by Pacific Bell and GTE although telecommunications for the airfield will be retained by the military. Chambers Cable T.V. serves the Novato area and the Base.

Marin LAFCO's Policy Guidelines for the Hamilton Air Force Base reorganization, as discussed in the introduction to Section 3.1.5 Public Services, suggests that the base be annexed to the Novato Sanitary District and the North Marin Water District (NMWD). The service impacts of doing so are discussed in the following sections, while the fiscal impacts of doing so are discussed in Section 3.1.11, Costs/Revenues.

WATER

Setting

Water supply has been a major political and environmental issue in Marin County since the 1972-3 and the 1976 droughts. Major rains replenished reservoir stocks in 1978, and storage capacity has been increased, thereby alleviating the urgency of the water supply situation.^{1,2}

Two districts supply water to the Novato area: the Marin Municipal Water District (MMWD) and the North Marin Water District (NMWD). The Marin Municipal Water District is currently the primary source of all water for drinking, irrigation, and fire protection at Hamilton Air Force Base. However, the NMWD and MMWD systems are interconnected to provide both supplemental and emergency backup service to various parts of the two service areas, including Hamilton.³ Consumption during drought years 1972-3 was 1,000 acre-feet, and the highest recorded year of use prior to 1979 was 1,800 acre-feet in 1969.¹

The MMWD's service area covers 140 square miles in Marin County, from the Golden Gate Bridge in the south to Hamilton Air Force Base in the north to San Geronimo Valley in the west. The District serves a population of 165,000 people. The primary water supply comes from rainfall runoff which is caught by seven local reservoirs possessing approximately 80,010 acre-feet of storage capacity. Rainfall runoff amounted to 45,112 acre-feet in fiscal year 1984-5, while it was 60,904 acre-feet in fiscal year 1983-4. The Sonoma County Water Agency assures the District of an additional 43,000 acre-feet per year. Storage capacity of the MMWD's 135 tanks is 175 acre-feet.²

Total water production in 1987 was 32,890 acre-feet, of which 29,750 acre-feet were delivered to metered water users. Although the District's storage capacity exceeds 80,000 acre-feet, its safe yield level during a critical dry year is actually below its current consumption.⁴ The district is currently working to obtain additional water supplies to correct this situation.

The North Marin County Water District (NMWD) is a special district serving two distinct areas: the City of Novato except Hamilton Air Force Base, and the western Marin communities of Point Reyes Station, Olema, and Inverness Park. The District's primary water supply comes from two sources: Stafford Lake and the Russian River Aqueduct. The District also has reservoirs and storage tanks located throughout the Novato area. During the 1987 water year the District produced 9,803 acre-feet of water, 7,901 from the Russian River and 1,902 from Stafford Lake.

The District has projected that its current water sources will be sufficient through 1995. It is currently negotiating new contracts for its aqueduct sources which will provide sufficient water through the year 2015.

Impacts

PROPOSED PROJECT

The two water districts have held recent discussions regarding the possibility of NMWD assuming service responsibility for the project, but this issue has not been resolved.

Table 3.1.6-1 summarizes the project's estimated water demand. Total demand at project buildout in 1999 is estimated at roughly 970 acre-feet. This represents nearly 10% of NMWD's current water production and about 3% of MMWD's 1984 production. It is higher than the water estimate for the previous Hamilton proposal due to the higher number of residential units.

Either water district will require a new distribution system, along with associated storage facilities to meet domestic and fireflow requirements.

ALTERNATIVE 1: DECREASED HOUSING, INCREASED JOBS

ALTERNATIVE 2: DECREASED HOUSING, DECREASED JOBS

ALTERNATIVE 3: INCREASED HOUSING, DECREASED JOBS

Each of the alternatives would reduce total water demand at the project site. Alternative 1 would generate a demand of about 935 AFY, only slightly less than the proposed project. Alternative 2 would have a demand of about 690 AFY. It is the only alternative that meets the 750 AFY allocation from MMWD. Alternative 3 would require nearly 900 AFY, again very similar to the proposed project.

Mitigation Measures

PROPOSED PROJECT

The project will upgrade the existing non-standard water system and provide a project area water service system meeting district standards.

The project will incorporate drought tolerant landscaping per water district guidelines.

Water conserving plumbing devices will be incorporated where feasible and in compliance with water district guidelines.

The project will use reclaimed water to reduce potable water consumption, if proven economically viable, in compliance with health standards, and if service can be extended to project. Reclaimed water would be used in roadway medians, parks and other large landscaped areas only.

Added water storage will be provided during Phase I and II. The water storage site will be detailed at the submittal of the Phase I precise plans.

ALTERNATIVE 1: DECREASED HOUSING, INCREASED JOBS
 ALTERNATIVE 2: DECREASED HOUSING, DECREASED JOBS
 ALTERNATIVE 3: INCREASED HOUSING, DECREASED JOBS

Mitigation for the project as proposed would apply equally to Alternatives 1, 2 and 3.

SEWER

Setting

The Novato Area lies within the jurisdiction of Novato Sanitary District whose main plant is located at the southeasterly end of Davidson Street, and whose Ignacio treatment plant is located off Bel Marin Keys Boulevard. Hamilton Field would be served by the Ignacio Treatment Plant. The capacity of the plant was 2.1 mgd average dry weather flow (ADWF) prior to the completion of recent improvements. The current capacity cannot be determined until the improvements are adjusted to function properly. Current flow (ADWF) to the plant is roughly 1.61 mgd. Current district-wide hookups amount to 17,014 residential and 427 commercial as of July 1987.⁶

The existing sewage collection and treatment system on Hamilton Field was constructed to serve military facilities owned and operated by the Federal Government. That system does not meet Novato Sanitary District Standards due to abnormal infiltration rates, and questionable construction methods and materials resulting in excessive treatment and maintenance costs. As part of upgrading their housing facilities, the Navy has recently designed and built a pump station on Escolta Avenue (East Hamilton Pump Station), with a force main (west of the Hangars) to convey sewage to the Ignacio Treatment Plant.⁷

The increase in demand for sanitary sewage collection and treatment was anticipated by the Novato Sanitary District and incorporated by the Navy into the design of the East Hamilton Pump Station and force main. The pump station's design capacity is 2.72 mgd peak wet-weather flow.⁷

TABLE 3.1.6-1
WATER DEMAND ESTIMATE
Proposed Project

A. Commercial Buildings Landscape Area = 31.4 Acres

	<u>Percent of Land Area</u>	<u>Water Use</u>	<u>Acre Feet</u>
Turf	0.1	3	9.4
Ground Cover	0.3	2	18.8
Drought Tolerant	0.5	1	15.7
Drip	0.1	0.5	1.6
Subtotal			45.5

B. Commercial Buildings Internal Use

	<u>Floor Area (000's)</u>	<u>Gals/SF Per Day</u>	<u>Days Operation</u>	<u>Acre Feet</u>
Office	690	0.109	260	60.0
Medical Research	440	0.123	260	43.0
Other Research	300	0.088	260	21.1
Industrial	300	0.068	260	16.2
Warehousing	300	0.023	260	5.5
Retail	250	0.026	260	5.2
Hospital	120	0.136	365	18.3
Other Medical	300	0.136	365	45.7
Hotel	200	0.136	365	30.5
Subtotal				245.3

C. Residential Potable Use

Population	7,607	70	365	596.2
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D. Residential Landscaped Area = 53.5 Acres

	<u>Percent of Land Area</u>	<u>Water Use</u>	<u>Acre Feet</u>
Turf	0.1	3	16.1
Ground Cover	0.3	2	32.1
Drought Tolerant	0.5	1	26.8
Drip	0.1	0.5	2.7
Subtotal			77.6

TABLE 3.1.6-1, Continued

E. Streetscape Area = 6 acres

SUMMARY

	<u>Acre Feet</u>
A. Commercial Buildings Landscape Area	45.5
B. Commercial Buildings Internal Use	245.3
C. Residential Potable Use	596.2
D. Residential Landscaped Area	77.6
E. Streetscape Area	<u>6.0</u>
Total Annual Requirement	970.6

Sources for water use factors are Jim Mistrion and Bill Young of Marin Municipal Water District and John Stuber of Stuber-Stroeh Engineers.

Impacts

PROPOSED PROJECT

Service to the project by the Novato Sanitary District would involve annexation as discussed in the introduction above. The project would then be served by the Novato Sanitary District's Ignacio Treatment Plant located approximately 1.5 miles north of the project site. The new East Hamilton Pump Station and force main will be owned and operated by the Novato Sanitary District, and will be utilized by the Hamilton Field Project. The balance of the existing sanitary system serving the Master Plan Area of Proposed Redevelopment Project Area #3 will be completely reconstructed to District Standards, and turned over to the District for operation and maintenance.⁷

Table 3.1.6-2 below summarizes estimates for wastewater flow generated by the project. Peak wet weather flow from the project at buildout is estimated at 2.87 mgd, while average dry-weather flow is estimated at 1.18 mgd. Although precise capacity data are not available, it is likely that the full buildout of the project will require an expansion of the Ignacio Treatment Plant.⁸ As shown in the table, the project is scheduled to reach 80% of its sewage flow by 1995.

TABLE 3.1.6-2
WASTEWATER FLOW ESTIMATE
Proposed Project

TOTAL AT BUILDOUT					
Land Use	Unit	Factor ¹	ADWF ²	PWWF ³	
Commercial	199 acres	5,000	497,500	995,000	
Residential Population	7,607 ⁴	90	684,672	1,711,680	
Residential Infiltration	163 acres	1,000		163,000	
Total			1,182,172	2,869,680	
ANNUAL DISTRIBUTION					
	1991	1992	1993	1994	
Commercial	258,303	460,562	627,944	714,578	
Residential Population	282,940	557,780	827,220	1,096,660	
Residential Infiltration	26,944	53,116	78,775	104,433	
Total	568,187	1,071,458	1,533,939	1,915,671	
	1995	1996	1997	1998	1999
Commercial	855,195	948,464	989,777	992,389	995,000
Residential Population	1,302,425	1,486,590	1,670,755	1,711,680	1,711,680
Residential Infiltration	124,027	141,565	159,103	163,000	163,000
Total	2,281,647	2,576,619	2,819,635	2,867,069	2,869,680

¹ Factors are from the Novato Sanitary District.

² ADWF is average dry weather flow and is used to evaluate the impact on a plant's wastewater treatment capacity. Figures shown are in gallons per day.

³ PWWF is peak wet weather flow and is estimated to determine sizing for pipes and the maximum holding capacity of the plant.

⁴ Based on analysis in Section 3.13 above, Population Employment and Housing.

At buildout, the project's peak wet-weather flow to the East Hamilton pump station will exceed the pump station's presently designed pumping capacity by .15 mgd with the Navy housing adding another .61 mgd. Thus, the addition of some higher capacity pumps will be required at the East Hamilton Pump station to accommodate the project. Minor pump stations to service some low lying areas may also be needed in order, for example, to pump sewage over the ridge from the Ammo dump to the East Hamilton Pump Station.

ALTERNATIVE 1: DECREASED HOUSING, INCREASED JOBS
 ALTERNATIVE 2: DECREASED HOUSING, DECREASED JOBS
 ALTERNATIVE 3: INCREASED HOUSING, DECREASED JOBS

Peak Wet Weather Flow is estimated at 2.72 mgd for Alternative 1, 2.13 mgd for Alternative 2, and 2.97 mgd for Alternative 3 with its higher number of residential units. All of the alternatives would likely create the need for further expansions of the pump station and the treatment plant, although Alternative 2, combined with the Navy housing allocation, would only slightly exceed the pump station capacity by .02 mgd.

Mitigation Measures

PROPOSED PROJECT

The project phasing program does not show major sewer improvements until Phase III, although upgrading the on-site connection system would seem to be necessary in Phase I. The Master Plan indicates that the developer will pay collection fees for use in upgrading the pump station and the treatment plant based on the phasing of development and corresponding sewage flows. The Sanitary District requests that a comprehensive agreement specifying the means and phasing of payment for all off-site improvements be reached prior to the commencement of Phase I.⁸ The District is concerned that in later phases, additional property owners may be involved in the project, making a comprehensive and coordinated resolution of the sewer improvements financing more difficult. Also, if the project meets its development goals, only five years will elapse between beginning of construction and reaching 80% of the total projected sewage flow.

ALTERNATIVE 1: DECREASED HOUSING, INCREASED JOBS
 ALTERNATIVE 2: DECREASED HOUSING, DECREASED JOBS
 ALTERNATIVE 3: INCREASED HOUSING, DECREASED JOBS

Mitigation for the project as proposed would apply equally to Alternatives 1, 2 and 3.

GAS & ELECTRIC

Setting

Power is currently supplied by Pacific Gas and Electric Company (PG&E) through a 60 kv high line from its Ignacio substation, and a small substation on the base itself. The high line runs along the Western Pacific Railroad right-of-way and ultimately serves Sausalito. Distribution within the base is by low voltage overhead lines, with the on-site system privately owned and operated. The main gas supply line for this part of Marin County follows Highway 101, serving HAFB through secondary mains that will be enlarged as demand increases.¹

Impacts

PROPOSED PROJECT

Electric power and gas facilities are available upon demand from PG&E for serving the project. Adequate electric and natural gas capacity exists in facilities located adjacent to the project.⁹ Connection for electric power is available from an existing 12 kv line along Nave Drive originating at the sub-station of PG&E. Connection for natural gas is available from a PG&E gas line along Nave Drive. However, right-of-way for crossing government property to provide service must be arranged.⁹

The peak load of the project is estimated at 39,000 KW, with a connected kilowatt load of 52,000 KW. Total annual electrical and gas consumption is estimated at 76 million KWH and 3 million therms (see Section 3.1.7 Energy for a more detailed discussion).

ALTERNATIVE 1: DECREASED HOUSING, INCREASED JOBS

ALTERNATIVE 2: DECREASED HOUSING, DECREASED JOBS

ALTERNATIVE 3: INCREASED HOUSING, DECREASED JOBS

Refer to Section 3.1.7, Energy, for energy consumption of the three Alternatives compared to the project as proposed.

Mitigation Measures

PROPOSED PROJECT

All utility lines will be undergrounded where possible.

ALTERNATIVE 1: DECREASED HOUSING, INCREASED JOBS
ALTERNATIVE 2: DECREASED HOUSING, DECREASED JOBS
ALTERNATIVE 3: INCREASED HOUSING, DECREASED JOBS

Mitigation for the project as proposed would apply equally to Alternatives 1, 2 and 3.

COMMUNICATIONS

Setting

Military operations are retaining telecommunication facilities for the Airfield. Telephone services are provided by Pacific Bell.¹⁰

Telephone and C.A.T.V. facilities are available upon request from Pacific Bell and Chambers Cable T.V., respectively.¹⁰

Impacts

PROPOSED PROJECT

Phone service to the project will be provided by Pacific Bell. Alternative telecommunications facilities including terrestrial microwave, satellite uplinks, and fibre optic cable may be utilized and such facilities can have a negative visual impact if their placement is uncontrolled.

ALTERNATIVE 1: DECREASED HOUSING, INCREASED JOBS
ALTERNATIVE 2: DECREASED HOUSING, DECREASED JOBS
ALTERNATIVE 3: INCREASED HOUSING, DECREASED JOBS

Communications impacts for the project as proposed would apply equally to Alternatives 1, 2 and 3.

Mitigation Measures

All communications lines in the project would be in underground conduits. Antennas would be consolidated, wherever possible, and carefully controlled in terms of visual impacts by architectural review procedures included in land leases or CC&Rs.¹⁰

Conduits and space for related facilities would be provided in utility and/or private easements throughout the project area so that residents and business users can connect to telephone and cable television services. Radio towers and antennas for business microwave services should be sited and screened as much as feasible to minimize their visual presence, and given the technical requirements, the color, shape and size of these facilities should be controlled to minimize any negative visual impacts and, wherever possible, be consolidated. Standards for rooftop antennas would be strictly enforced through design guidelines and CC&Rs.¹⁰

ALTERNATIVE 1: DECREASED HOUSING, INCREASED JOBS

ALTERNATIVE 2: DECREASED HOUSING, DECREASED JOBS

ALTERNATIVE 3: INCREASED HOUSING, DECREASED JOBS

Communications mitigation for the project as proposed would apply equally to Alternatives 1, 2 and 3.

¹ U.S. General Services Administration. Draft EIR On Disposition And Use Of Federal Surplus Property At Hamilton Air Base, Novato, California. April 1979, pp. 6/8, VI-50,147/8,150/1.

² Marin Municipal Water District, 1985 Annual Report.

³ Ronald L. Johnson, General Manager, Marin Municipal Water District, telephone communication, July 5, 1988.

⁴ Eric McGuire, Marin Municipal Water District, telephone conversation, March 15, 1988.

⁵ John Nelson, General Manager of North Marin Water District, telephone conversation, February 9, 1988.

⁶ Bob Bolick, Engineering Assistant, Novato Sanitary District, personal communication, March 15, 1988.

⁷ City Of Novato Redevelopment Agency, Novato Redevelopment Survey Area No. 3. Hamilton Field and Related Properties, Condition Review and Cost Estimate, Prepared by Stuber-Stroeh Associates, Inc., July 1986.

⁸ Charles Joseph, Manager Engineer, Novato Sanitary District, telephone conversation, March 7, 1988.

⁹Lou Ann Sandoval, Novato Manager, PG&E, letter to Leslie Carmichael, Environmental Coordinator City of Novato, January 13, 1986.

¹⁰Berg-Revoir Corporation. Environmental Data Submission.

SUMMARY COMPARISON OF IMPACTS AND MITIGATION MEASURES

3.1.6 UTILITIES

1. WATER	IMPACT	MITIGATION
PROPOSED PROJECT	The proposed project will annually demand an estimated 970 acre feet of water which can be supplied by either the North Marin Water District (NMWD) or Marin Municipal Water District (MMWD). During dry years, however, the NMWD will need backup water supplies to meet excess demand.	A water conservation program has been proposed which uses low-irrigation landscaping, incorporates water-saving plumbing devices into buildings, and uses reclaimed water where feasible.
ALTERNATIVE 1: (Decreased Housing, Increased Jobs)	Project Alternative #1 will annually demand 935 acre feet of water, slightly less than the proposed project. The NMWD will still need backup supplies to meet peak demand during dry years.	Mitigation would be the same as for the proposed project.
ALTERNATIVE 2: (Decreased Housing, Decreased Jobs)	Project Alternative #2 will annually demand 690 acre feet of water which is only 71 percent of the water that will be demanded by the proposed project. This is the only project where backup water supplies will not be needed to meet peak demand during dry years.	Mitigation would be the same as for the proposed project. Water conservation measures should be encouraged to ensure adequate water supply for future growth and protect existing resources even though water supplies are adequate to serve the scale of project Alternative #2.
ALTERNATIVE 3: (Increased Housing, Decreased Jobs)	Project Alternative #3 would annually require nearly 900 acre feet of water, and closely resemble the water demands of the proposed project. Backup supplies would be needed during dry years.	Adopt an adequate water conservation plan as explained under the proposed project above.

SUMMARY COMPARISON OF IMPACTS AND MITIGATION MEASURES

3.1.6 UTILITIES

2. SEWER	IMPACT	MITIGATION
PROPOSED PROJECT	The Ignacio treatment plant and East Hamilton Pump Station are currently being used at 1.6 mgd. Peak wet weather flow from the project at buildout will add an estimated 2.87 mgd. to the total sewage flow.	The project sponsor should enter into an agreement with the Sanitation District to ensure that the sewage treatment plant is expanded in proportion to the scale of development.
ALTERNATIVE 1: (Decreased Housing, Increased Jobs)	Peak wet weather flow from project Alternative #1 will add an estimated 2.72 mgd. to the total sewage flow.	Mitigation would be the same as for the proposed project.
ALTERNATIVE 2: (Decreased Housing, Decreased Jobs)	Peak wet weather flow from project Alternative #2 at buildout is estimated to be 2.13 mgd.	Mitigation would be the same as for the proposed project.
ALTERNATIVE 3: (Increased Housing, Decreased Jobs)	Peak wet weather flow from project Alternative #3 will be 2.97 mgd., which is higher than the proposed project.	Mitigation would be the same as for the proposed project.

SUMMARY COMPARISON OF IMPACTS AND MITIGATION MEASURES

3.1.6 UTILITIES

3. COMMUNICATIONS	IMPACT	MITIGATION
PROPOSED PROJECT	Phone service will be provided by Pacific Bell. Alternative telecommunications facilities including terrestrial microwave, satellite uplinks, and fibre optic cable may be utilized.	Communication lines in the project should be placed underground. Antennas should be consolidated and their visual impact carefully controlled by architectural review. Visual impact should be minimized from radio towers and antennas.
ALTERNATIVE 1: (Decreased Housing, Increased Jobs)	Impacts would be the same as for the proposed project.	Mitigation would be the same as for the proposed project.
ALTERNATIVE 2: (Decreased Housing, Decreased Jobs)	Impacts would be the same as for the proposed project.	Mitigation would be the same as for the proposed project.
ALTERNATIVE 3: (Increased Housing, Decreased Jobs)	Impacts would be the same as for the proposed project.	Mitigation would be the same as for the proposed project.

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3.1.7 ENERGY

SETTING

Pacific Gas and Electric Company (PG&E) supplies both natural gas and electricity to customers in Novato and to Hamilton Air Force Base. PG&E generates electrical energy from various sources including oil, natural gas, wind, cogeneration, solid waste, hydroelectric, geothermal and nuclear power.¹

An EIR prepared by the General Services Administration for the project site noted that, according to 1979 billings, Hamilton's energy use at that time was about 14 billion British thermal units (Btu)² of gas and electricity per year.³

New buildings in California are required to conform to stringent energy conservation standards specified in Title 24 of the California Administrative Code. These articles of the Code require inclusion of state-of-the-art energy conservation features in building design and construction. The state allows developers to comply with the standards via the component performance standards method, which requires that a project sponsor do one of the following: incorporate into the building a set of specific energy-conserving design features, use non-depletable energy resources, or demonstrate that the building would comply with a specified "energy budget," that is, consume no more than a certain quantity of energy that is specified for different types of building uses. Documentation showing compliance with standards is submitted with the application for the building permit and the standards would be enforced by the city of Novato's Building Department.

Two policies of the Novato General Plan's Development Standards for Hamilton Air Force Base relate to the project's energy use:

- o "Energy Conservation. Orientation of buildings, use of materials, and landscaping should maximize net solar gain, by using the sun for maximum heating in winter and cooling in summer. For example, buildings should have a north-south rather than east-west orientation, with the largest window areas on south-facing walls. Trees should be located to provide windbreaks without interfering with the placement of rooftop solar panels."
- o "Alternate Energy Sources. The direct inclusion of experimentation and application of new energy sources to reduce dependence on fossil fuels, including solar, wind, and biomass, is encouraged. At a minimum, the project should leave options open for later inclusion of new technology that is not yet ready for application."⁴

IMPACTS

PROPOSED PROJECT

The primary project impact on energy resources would be the consumption of nonrenewable energy during project construction and operation. In addition, project-generated motor vehicle traffic would consume gasoline, oil and diesel fuel during transportation of residents and workers to and from the project site.

Existing gas and electrical lines in the Hamilton area were built to serve military uses and are not capable of providing sufficient energy to the project and will need to be upgraded.⁵ Connections from the project site to trunk lines also must be constructed. The project engineer notes that there is little opportunity to conserve fuel oil and gas by rehabilitating existing heating systems.⁶

Construction

Demolition of existing buildings would require unknown amounts of energy. The energy for demolition and debris removal is not expected to be significant. The total estimated energy usage for construction of the proposed project would be 913 billion Btus. By annualizing this estimate over the projected life of the project, the annual energy usage for the project's construction would be 18.3 billion Btus or about 3,270 barrels of oil. This estimates includes gasoline, diesel fuel and electricity for fabrication and transportation of building materials, worker transportation, site development and building construction.⁷

Operation

Table 3.1.7-1 estimates the project's maximum allowable annual operational energy in accordance with Title 24 regulations. Natural gas and electricity requirements have been converted to at-source Btus in order to account for losses in energy that occur during generation, transmission and distribution of the various forms of energy.⁸ Annual energy consumption of the project would be about 668 billion Btu, the equivalent of about 119,000 barrels of oil. Project operational energy requirements would account for about 11% of Novato's annual energy use at buildout, which was estimated to be 6.2-7.2 trillion Btu in the Novato General Plan.⁹ PG&E foresees no difficulty in supplying the project with sufficient natural gas and electricity from existing and planned sources. However, PG&E emphasizes that it is essential that they be kept abreast of the planning process for the

TABLE 3.1.7-1
ANNUAL PROJECT ENERGY USE

I. PROJECT OPERATION						Total Operating Energy (million Btu)
Land Use	Developed Space	Allowance	Natural Gas (Therms) ¹	Electricity (kWh) ²	Peak Electrical Load (kWh)	
Residential:						
Rental	2,600 DUs	21,500 Btu/sq.ft.	41,000	3,562,000	11,200	40,600
Retirement	550 DUs	21,500 Btu/sq.ft.	7,000	650,000	2,000	7,400
Sale	400 DUs	21,500 Btu/sq.ft.	9,000	794,000	2,500	9,000
	plus	20,800 Btu/DU (water heating)	700			100
Office/R&D	1,430,000 sq.ft.	126,000 Btu/sq.ft.	180,000	22,988,000	10,000	253,400
Warehousing	300,000 sq.ft.	104,000 Btu/sq.ft.	31,000	4,242,000	2,100	46,500
Retail	250,000 sq.ft.	200,000 Btu/sq.ft.	50,000	5,645,000	1,800	62,800
Light Industry	300,000 sq.ft.	104,000 Btu/sq.ft.	31,000	4,242,000	2,100	46,500
Hotel	200,000 sq.ft.	NA	44,000	4,867,000	1,200	54,200
Health Care	420,000 sq.ft.	NA	126,000	13,175,000	2,900	147,500
Subtotal Operating Energy			519,700	60,165,000	35,800	668,000
II. TRANSPORTATION						Subtotal Transportation Energy (million Btu)
5,391,119 gallons of gasoline and diesel fuel consumed per year						754,757
III. CONSTRUCTION						Annualized Construction Energy (million Btu)
Project		Total Construction Energy (million Btu)				
		714,000				14,300
On-Site Improvements		113,000				2,300
Off-Site Improvements		86,000				1,700
Subtotal Construction Energy		913,000				18,300
Project Total						1,441,057

¹ Assumes 10% of the total Btus would be generated with natural gas.

² Assumes 90% of the total Btus would be generated with electricity.

project to assure that the demand load for natural gas and electricity for the project can be supplied as it is required.¹⁰

Project-related automobile transportation would cause additional, off-site energy consumption. For the project trip generation described in Section 3.1.4, Traffic and Transportation, project-related trips would require about 5,391,120 gallons of gasoline per year.¹¹ Converted to a common thermal energy unit, this gasoline use would equal about 755 billion Btu per year, the energy equivalent of 135,000 barrels of oil. The project use is based upon the mix of highway vehicles in California in 1995.

An additional undetermined amount of transportation-related energy consumption would arise from project-related use of local transit systems. As traffic mitigation measures specified in Section 3.1.4 are implemented, transit energy use would increase but would be more than offset by decreases in the energy consumption of private automobiles.

ALTERNATIVE 1: DECREASED HOUSING, INCREASED JOBS

Overall energy consumption requirements for this alternative is estimated to be 2% higher than for the proposed project. The operational energy usage would be increased by 5%. Transportation and construction energy usage is estimated to be reduced by less than 1% each.

ALTERNATIVE 2: DECREASED HOUSING, DECREASED JOBS

Overall energy consumption requirements for this alternative is estimated to be 27% lower than for the proposed project. The operational energy usage would be reduced by 18%. Transportation and construction energy usage is estimated to be reduced by 35% and 22% respectively.

ALTERNATIVE 3: INCREASED HOUSING, DECREASED JOBS

Overall energy consumption requirements for this alternative is estimated to be 25% lower than for the proposed project. The operational energy usage would be decreased by 25%. Transportation and construction energy usage is estimated to be reduced by 25% and 13%, respectively.

MITIGATION MEASURES

Statutory Requirements

The project sponsor is required by law to demonstrate compliance with the stringent standards of the California Administrative Code, Title 24, prior to issuance of a building permit. New buildings also must comply with strict requirements of the Uniform Building Code regarding insulation, glazing, weather sealing, choice of building materials and water and energy conserving plumbing fixtures. A number of design features that would aid the project in achieving compliance with Title 24 standards are listed below. Features not specifically required by Title 24 and not included in the project proposal could be included as part of the project to further reduce energy consumption. However, these additional mitigation measures are not required by law.

Novato's Energy Policies as outlined in the General Plan require location of transit facilities and bikeways appropriately to encourage decreased reliance on private automobiles and the consumption of energy.

Mitigation Measures Included as Part of the Project

Land Use:

The project's mix of uses would be fairly energy-conserving by allowing businesses and residents access to a variety of local services and a nearby labor pool. As a result, the project's development would be expected to create less motor vehicle trips and less fossil fuel consumption than would a single-use project of similar size.

Transportation:

- o Development of a Traffic Reduction Plan (see Section 3.1.4, Traffic and Transportation).
- o Transit facilities and bike paths would be incorporated into the project's layout where appropriate.

Architectural:

- o Spanish-style architecture would incorporate several features to reduce cooling requirements, including: courtyards to retain cool night air during the early part of the day; thick, well-insulated, light-reflective walls; recessed windows to avoid direct sun into building interiors.

- o Landscaping would be designed to shade paved surfaces and western building edges.
- o Project design and layout would maximize use of natural lighting and ventilation.
- o Buildings would be oriented for maximum Southern exposure (passive solar heating).

Electrical:

- o Project design would incorporate the use of energy-efficient lighting, such as high intensity discharge or fluorescent lamps, when feasible with respect to project aesthetics.
- o Use of light reflective materials to finish interior walls and ceilings thereby potentially reducing electrical demand.

The following additional mitigation measures are provided as additional suggestions for further reduction of energy consumption:

Architectural:

- o Use vegetation and water inside courtyards to provide additional air cooling.
- o Reduce window surfaces on the north face to minimize heat loss.¹²
- o Windows enclosing air conditioned space would be openable and local climate controls provided so occupants can open the window and turn off the air conditioner when weather permits.
- o Minimize exterior surface area through the architectural design.
- o Use landscaping design to enhance passive solar energy efficiency and reduce the wind on the surface of the buildings. This mitigation is also identified in the general development standards outlined in the Novato General Plan.
- o Use building overhangs or other horizontal sun shades to shade the south faces of the buildings to reduce cooling loads while maintaining glass area that would provide significant daylight contribution for reducing artificial lighting demands.
- o Windows facing east and west should be either recessed or vertical sun shades provided to facilitate sun shading while maintaining a glass area that provides a significant daylight contribution for reducing artificial lighting demands.
- o Windows facing south should utilize horizontal shading devices or reflective glass to facilitate sun shading while maintaining sufficient natural light.
- o Use heat-reflecting glazing on windows that are not shaded.

Electrical:

- o Use miniature fluorescent lamps to replace incandescent lamps in fixtures where possible.
- o Use energy efficient high pressure sodium lighting for roadways, walkways, etc., with time-clock or photocell control.

Solar Energy:

Encourage the use of solar energy technology with relation to:

- o Water heating.
- o Natural ventilation through passive solar energy convection techniques.

Heating, Ventilating and Air Conditioning:

The project sponsor will prepare a feasibility study of centralized heating and cooling systems for the project or portions of the project. For example, a centralized cooling system using nighttime chilled water storage will enable the project's cooling needs to be met during off-peak hours, thereby conserving energy. The project sponsor notes that, although there may be some economies of scale in providing centralized space-conditioning facilities, several difficulties are immediately apparent. First, a centralized system will require a new underground piping system separate from facilities already in place. Second, the project will have multiple owners after its development, thereby complicating utility service provision and billing.

ALTERNATIVE 1: DECREASED HOUSING, INCREASED JOBS

ALTERNATIVE 2: DECREASED HOUSING, DECREASED JOBS

ALTERNATIVE 3: INCREASED HOUSING, DECREASED JOBS

Energy mitigation for the project as proposed would apply equally to Alternatives 1, 2 and 3.

¹PG&E Annual Report, San Francisco, 1981.

²The British thermal unit (Btu) is the quantity of heat required to raise the temperature of one pound of water one degree fahrenheit at sea level.

- ³ U.S. General Services Administration, Draft EIS on Disposition and Use of Federal Surplus Property at Hamilton Air Force Base, Novato, California, Washington, D.C., April, 1979.
- ⁴ Novato General Plan, November, 1981.
- ⁵ Berg-Revoir Corporation, Environmental Data Submission for Hamilton Field, December 1985.
- ⁶ John Stuber, Project Engineer, Stuber-Stroeh Associates, telephone communication, July 31, 1986.
- ⁷ Hannon, B. et al., Energy and Labor in the Construction Sector, "Science" 202:837-847.
- ⁸ The term "at-source" means that adjustments have been made in the calculation of the thermal energy equivalent (Btu) to account for losses in energy that occur during generation, transmission and distribution of electrical energy. See Apostolos, J.A., W.R. Shoemaker and E.C. Shirley, Energy and Transportation System, California Department of Transportation, Sacramento, California, Project #20-7, Task 8, 1978.
- ⁹ Novato Planning Department, Novato General Plan, November 1981.
- ¹⁰ Lou Ann Sandoval, Planning District Manager, PG&E, letter, April 28, 1988.
- ¹¹ The California Air Resources Board's (CARB's) URBEMIS#1 computer model was used for estimating vehicular fuel use.
- ¹² Edward Mazria, The Passive Solar Energy Book, Rodale Press, Emmaus, PA, 1979.

Additional reference material used:

Bay Area Air Quality Management District, Air Quality and Urban Development: Guidelines for Assessing Impacts of Projects and Plans, San Francisco, November, 1985.

Rau and Wooten, Environmental Impact Analysis Handbook, McGraw Hill, 1980.

SUMMARY COMPARISON OF IMPACTS AND MITIGATION MEASURES

3.1.7 ENERGY

	IMPACT	MITIGATION
PROPOSED PROJECT	<ul style="list-style-type: none"> * Use of non-renewable energy resources during project construction. * Use of non-renewable energy resources during operation and maintenance of buildings. * Use of non-renewable energy resources during transportation to and from the project site during the project operation. 	<ul style="list-style-type: none"> * None recommended. * Design buildings to use renewable energy resources, specifically passive and active solar energy design. * Incorporate recommendations from the section of this report regarding development of public transportation systems and other energy saving methods of transportation.
ALTERNATIVE 1: (Decreased Housing, Increased Jobs)	Overall 2% increase in energy demands from proposed project.	Mitigation would be the same as for the proposed project.
ALTERNATIVE 2: (Decreased Housing, Decreased Jobs)	Overall 27% decrease in energy demands from proposed project.	Mitigation would be the same as for the proposed project.
ALTERNATIVE 3: (Increased Housing, Decreased Jobs)	Overall 25% decrease in energy demands from proposed project.	Mitigation would be the same as for the proposed project.

3.1.8 HAZARDOUS MATERIALS

SETTING

Hamilton Air Force Base for many years supported the operation and maintenance of aircraft. These activities involved the use of hazardous materials.¹ Many above ground and underground storage tanks were installed containing a variety of fuels, oils, solvents and chemicals during general operation of the base, and aircraft maintenance required activities of welding, plating, electronics use, engine and airframe repair.

In early 1985, the General Services Administration requested that the Department of Defense, Presidio of San Francisco, conduct a survey of the Hamilton surplus property to evaluate the presence of hazardous materials. A preliminary survey by the U.S. Army Environmental Office, Directorate of Engineering and Housing, Presidio of San Francisco, indicated that hazardous wastes were generated during the operation of the Base and that some of these materials may have contaminated portions of the Base. In addition, a visual survey was made of buildings to identify the potential presence of asbestos materials. On the basis of visual inspection, asbestos was suspected in some buildings as part of siding material and around pipe installations.² Accordingly, a study was commissioned by the Army to identify the existence of surface and subsurface contamination within the project site to confirm the existence of on-site contamination of soils and groundwater.³ Following the completion of the Confirmation Study, the U.S. Army Corps of Engineers, Sacramento District, prepared a proposed Remedial Action and Remedial Investigation Report,⁴ for the project site. Remedial actions are currently being completed by the Corps of Engineers in accordance with the Remedial Actions Report.

Land Disposal Areas

A documents search and interviews with former military and civilian personnel who were stationed at Hamilton Air Force Base was the basis for the identification of hazardous material waste disposal practices and disposal sites at Hamilton. Most of the records of Base operations had been removed from the Base and were unavailable for review. However, a set of 1967 Base master plans was recovered from the Personnel Department at Bolling Air Force Base, Washington D.C. These plans listed and showed the locations of industrial facilities, salvage yards, and solid waste disposal areas. Other data obtained at Bolling Air Force Base indicated that during World War II, all refuse material was

segregated into salvageable and non-salvageable material. Non-salvageable material such as paper, cardboard, glass and some metal were disposed at the landfill located adjacent to the Quartermaster's Salvage Yard at the base of Ammo Hill (see Figure 3.1.8-1 for approximate locations).

Hydraulic fluids, paint thinners and waste gasoline that were not reclaimed were delivered to the Crash Fire Station, Building T-141 and turned over to the fire department. Most metal items were directed to the Quartermaster's Salvage Yard. The fire department used the contaminated fuels and solvents in routine fire training exercises located at the northeast and eastern ends of the Base. The exact locations of these burn pits is not shown on any known existing documents, but through interviews are reported to be outside of the project site.

Interviews also identified several areas which were thought to be contaminated with hazardous materials. These areas include the Quartermaster's Salvage Yard, the suspected waste disposal areas (Figure 3.1.8-1) and the original Base vehicle service station at the southwest corner of Escolta Avenue and San Pablo Avenue.

Underground Fuel Storage Tanks

The documents search also indicated underground fuel storage tanks were located throughout the Base; many of these tanks had been installed in the late 1930s and early 1940s. The operation and closure of underground fuel tanks is regulated by the Environmental Protection Agency through the Resource Conservation and Recovery Act, including the 1984 Hazardous and Solid Waste Amendments, and state of California regulations contained in California Administrative Code Title 23, Subchapter 16. The federal and state regulations recognize that underground tanks and associated piping often leak, resulting in contamination of soils and groundwater. In California, guidelines have been developed for actions to be implemented depending on the degree to which soils and groundwaters have been contaminated. For example, any soil that contains in excess of 1,000 parts per million (ppm) of hydrocarbons (fuel) is considered hazardous and must be excavated for removal; for soils that have been contaminated from leaking underground tanks of excess of 100 ppm, groundwater monitoring wells must be installed to ascertain if the groundwater has been affected by fuel contamination. The location of major underground fuel tank facilities identified on the project site are shown on Figure 3.1.8-1.

Ancillary Areas

An area immediately northeast of the project site was represented as being the location where radar tubes were disposed of. Subsequent investigations indicated that the radar tube disposal site was located near the north end of the runway further east than the originally suspected site and contained electron tubes and luminescent dials within a 14 inch-diameter corrugated steel pipe.

Site Exploration

The site exploration program was divided into two phases: Phase I addressed all identified above and below ground storage tanks, barrel storage and waste fuel areas, concrete sumps and petroleum-oil-lubrication (POL) facilities, while Phase II was directed toward undocumented landfill areas.

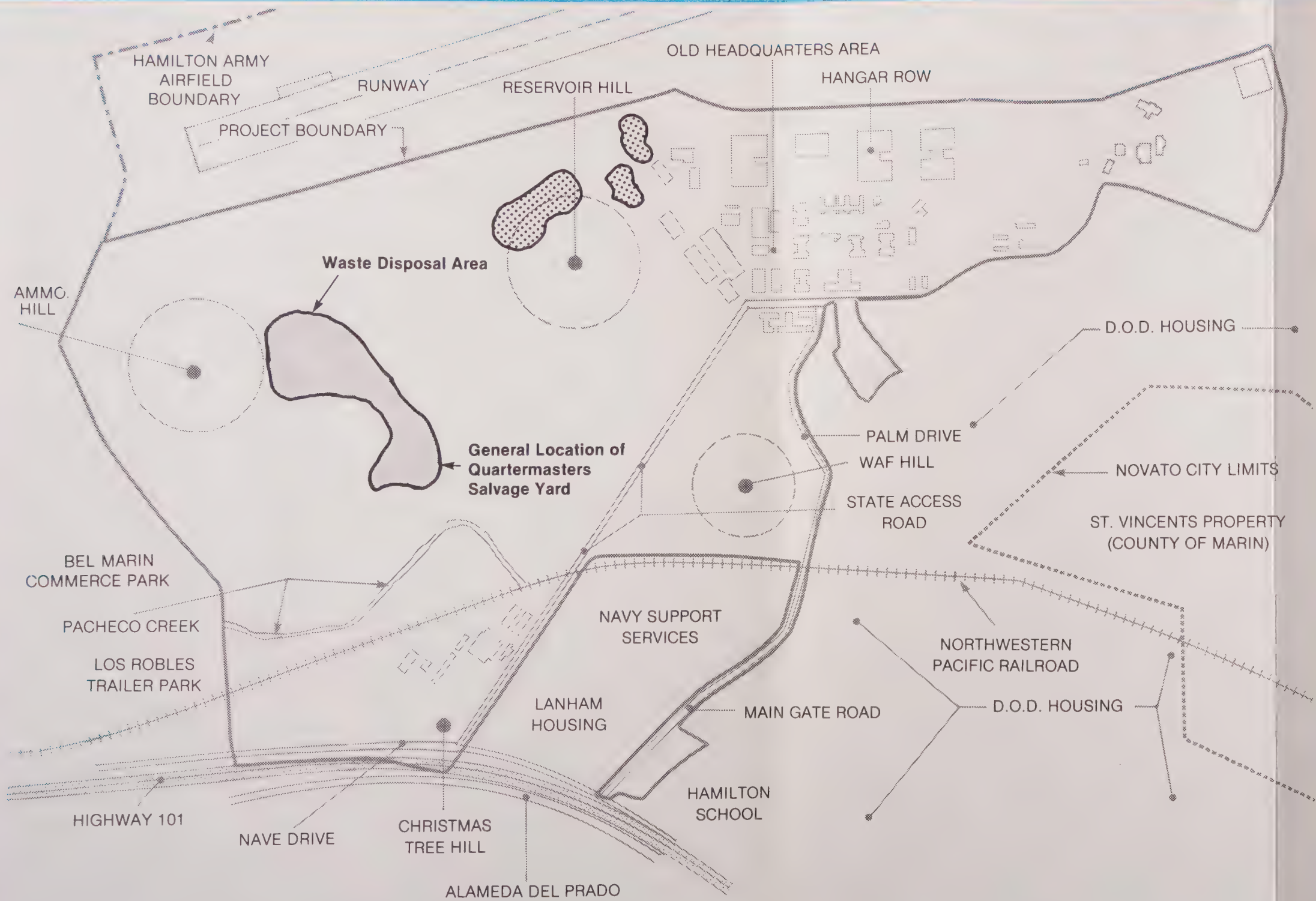
Underground Fuel Storage Tanks. In order to evaluate the potential extent of soil and groundwater contamination from leaking underground fuel storage tanks, an extensive field investigation program was undertaken. A total of 47 soil borings were completed, 24 monitoring wells installed, and trenches excavated and soil samples collected. These exploratory efforts were undertaken in areas where underground tanks were known to be located.

The soil samples collected were analyzed for hydrocarbons and priority pollutants (organics and metals). The hydrocarbon concentrations ranged from non-detected to 4,900 ppm near the north end of Hangar Avenue, by Building 318. Of the priority pollutants, the soil samples showed low concentrations of various pesticides. Metals were identified in the soil samples, but not in concentrations that would render the soils hazardous in accordance with Title 22 of the California Administrative Code.

Groundwaters were sampled from the monitoring wells that were installed: the waters were analyzed for hydrocarbons and priority pollutants. The hydrocarbon concentrations ranged from non-detected to 730 milligrams per liter (mg/L). The high level of hydrocarbons in the water was identified in the area on the north side of Reservoir Hill. Priority pollutant results indicated the presence of a number of organic compounds. The level of contamination is not exceeding levels indicated in Title 22 as hazardous.

HAMILTON FIELD
MASTER PLAN
EIR

FIGURE 3.1.8-1



Approximate locations
of former underground
fuel storage
tank areas.

HAZARDOUS
MATERIALS MAP



FEET
0 200 400 800

NORTH



However, in the same well in which the hydrocarbon concentration was identified (MW-1), a concentration of 42 parts per billion (ppb) of dichloromethane was found. The California Department of Health Services has an action level of 40 ppb for this compound. The Regional Water Quality Control Board, Central Valley Region, has developed Water Quality Objectives and Hazardous and Designated Levels for Chemical Constituents (July, 1985); in this document the Board recommends a level of not more than 19 ppb of dichloromethane in waters for the protection of groundwater quality.

Past Land Disposal Areas. The Phase II site exploration centered around evaluating the potential of the land disposal areas on the project site to have affected the quality of soils and groundwater. For the exploration, 12 soils borings were completed and 11 monitoring wells were installed. The soil samples were analyzed for hydrocarbons, and some for metals, while the water samples were analyzed for priority pollutants, metals and cyanide.

Data are available for the water quality analyses, performed on groundwater samples. No cyanide was identified in any of the samples. Metals were identified and the water standards were exceeded in a well southwest of Ammo Hill for chromium and barium. No priority pollutants were identified in monitoring wells on sites during Phase II that exceeded state criteria.

Ancillary Exploration Work. In addition to the work described above, the 584th Explosive Ordinance Control Center conducted an explosives survey of the areas identified as potential landfills. Ordinance locators were used to search for metallic objects. Eighty-five suspected area finds were excavated, all of which were found to be inert scrap metal. No explosives were discovered during the survey.

On June 26, 1986, field inspections succeeded in locating the suspected buried corrugated-metal pipe containing the assumed low level radiological wastes. The cylinder was located near the north end of the runway, several hundred feet east of the project site. Subsequent excavations of the surface soils revealed a second cylinder filled with concrete and emitting no radiation. The cylinders were recovered with soil after their discovery while plans for examining their contents and removal were being made. The cylinders are planned to be removed from the ground, placed in drums and shipped to a

waste disposal site licensed by the Nuclear Regulatory Commission. Although the discovery of low level radioactive waste raises the concern that similar conditions could exist elsewhere at Hamilton Field, all existing studies, documentation and research indicate that similar conditions do not exist in the area.

The Army indicated (letter from Department of the Army, Headquarters, Presidio of San Francisco to City of Novato, dated 22 January, 1986), that the potential exists for asbestos contaminated soils to be present in the vicinity of the WAF Hill barracks. The exploration work conducted to date has not included evaluation of this potential contamination area.^{3,4}

On the basis of the results obtained during the site exploration work, it was recommended that all identified subsurface storage tanks be removed and the surrounding backfill material sampled in a manner consistent with the guidelines put forth by the California State Water Resources Control Board and the San Francisco Bay Region Water Quality Control Board, Guidelines for Addressing Fuel Leaks (September, 1985).⁵

Clean-up actions of underground fuel storage tanks and associated contaminated soils and groundwater actions at Hamilton Field have included the removal of about 62 underground storage tanks on the project site, excavation of contaminated soils with off-site disposal of soils contaminated with metals and pesticides and on-site aeration of petroleum contaminated soils. It was specified that the aeration process be closely monitored to insure compliance with current Bay Area Air Quality Management District guidelines concerning aeration.

Remedial Actions

The U.S. Army Corps of Engineers has completed most of the process of removing underground fuel storage tanks. Contaminated soils were excavated and aerated on the northeast side of the runway on concrete aircraft pads. Soils contaminated with metals and pesticides were removed and disposed off-site at appropriate disposal sites.

The Corps of Engineers is also in the process of preparing a Remedial Investigation/Field Study (RI/FS) to identify the type and extent of contamination and evaluate cleanup alternatives for the approximate 26-acre land disposal site at the base of Ammo Hill.

Previous studies as well as preliminary data from the RI/FS indicate that, although the site does not pose current human health or environmental threats, there are some contaminants (principally fuel/hydrocarbons) which if not removed would limit the type of construction permitted on the land disposal site. While warehouse, industrial and office uses would likely be permitted under current State Department of Health Services guidelines, the land disposal site would not be suitable for residential construction unless remediated. Because the project proposal calls for residential development on the land disposal site, the project sponsor has advised both the General Services Administration and Army that the site must be fully remediated to allow unrestricted use (legislation directing the Air Force to fund cleanup of the land disposal site has been obtained).

The Draft RI/FS is anticipated to be completed in mid August of 1988 and public hearings will be held thereafter prior to selection of a cleanup alternative. Once the cleanup alternative is selected, the project sponsor anticipates actual land disposal site cleanup activities will extend over a two to three year period.

IMPACTS

PROPOSED PROJECT

Cleanup

The Department of the Army has assumed full responsibility for hazardous material clean-up activities at the project site on behalf of the Department of Defense, in accordance with the National Oil and Hazardous Substances Contingency Plan (40 CFR 300) and other applicable laws and regulations⁶ that protect workers and surrounding communities. Within the State of California, other laws and regulations would include California Administrative Code Title 22 and Title 23; the enforcing agencies are the Department of Health Services and the Regional Water Quality Control Board. These two agencies have developed guidelines for clean-up levels that would be applicable to the project site for soil and groundwater contamination, and the Army has been coordinating clean-up efforts with these agencies. Thus, construction or rehabilitation activities on those parts of the project site with identified contamination would proceed only after clean-up activities have been completed by the Army. If, during construction or site grading activities, underground fuel storage tanks were to be discovered, they would be removed in accordance with the State Guidelines by the Army.

Land Uses Involving Hazardous Materials

Commercial research and development (R&D) land uses have been proposed as part of the project. Biomedical research could be conducted as part of medical R&D activities. Such research would be conducted in laboratory settings and investigations into molecular genetics permitting the mapping, cloning, sequencing and transformation of genes cannot be ruled out. Other medical R&D activities could include personnel with skills in disciplines such as cell biology, biochemistry, biophysics, neurophysiology, physiological psychology and many other medical and scientific disciplines. R&D facilities, including light industrial uses, could utilize hazardous or toxic materials in their research and/or manufacturing operations. The nature and use of these substances has not been identified at this time. In addition, the quantities of hazardous substances that would be used, the amount of potential public exposure to the substances, the health effects of potential exposure or the synergistic effect of potential exposure to combinations of substances cannot accurately be determined at this time. The impacts associated with R&D and light industrial hazardous materials relates to their use, transport, disposal and potential health effects on area residents and workers from emissions during venting or resulting from a spill.

Recombinant DNA research, or R-DNA, developed over the last 15 years, has permitted a new and more precise kind of genetic manipulation than selective breeding affords. R-DNA techniques provide the ability to make extremely precise alterations in an organism rapidly to overcome the barriers of sexual incompatibility that have restricted efforts to move genes. The document Introduction of Recombinant DNA-Engineered Organisms into the Environment: Key Issues, published by the Council of the National Academy of Sciences, (National Academy Press, 1987), notes: "Several conclusions can be drawn from this review of the relationship between traditional genetic manipulation techniques and the R-DNA techniques developed during the last 15 years, and of the experience gained from the application of each. There is no evidence that unique hazards exist either in the use of R-DNA techniques or in the movement of genes between unrelated organisms. The risks associated with the introduction of R-DNA engineered organisms are the same in kind as those associated with the introduction of unmodified organisms and organisms modified by other methods." The document goes on to note (page 23): "Assessment of the risks of introducing R-DNA engineered organisms into the environment should be based on the nature of the organism and the environment into which it is introduced, not on the method by which it was produced."

It is expected that any R-DNA research would be related to medical R&D activities contained in laboratories.

Recombinant DNA research can involve the intentional breeding of animals with specific genetic characteristics or involve research which splices complete genes into living organisms. The operation of biomedical research facilities also involves the use of potentially hazardous materials. Handled inappropriately or illegally by untrained personnel, hazardous materials could prove a threat to public health and safety. Generally, however, the potential ill effects of hazards can be eliminated or reduced to acceptable levels by overall facility design and layout, by compliance with internal operating procedures, by compliance with both federal and local governmental agency regulations, and by the implementation of procedures developed to control emergencies and accidents. Any biomedical research, including biohazardous research and research involving recombinant DNA that would be conducted at Hamilton Field, would not be expected to have any adverse impact on human health and safety. This is because of existing regulations governing such research as define further in this section of the EIR (refer to the Mitigation portion of this section).

Transport and Disposal

The transportation of hazardous materials would be via the local highway and roadway system, including U.S. 101, State Route 37 and Interstate 580 (the Richmond-San Rafael Bridge). Any materials that would need to be removed for any site land uses for disposal by a certified carrier would likely be included within the transport of hazardous materials resulting from other sources. It cannot be ruled out that an accident on the roadway network would not occur involving the transport of hazardous materials. However, such an accident would not directly result from the proposed project unless the accident occurred while traveling to or from the project site itself. The chance for such an accident occurring is considered low to remote. The transport of hazardous materials is regulated by the California Highway Patrol and local law enforcement agencies.

Any chemicals or quantities of hazardous materials that could not be disposed in a laboratory equipped to use such chemicals or hazardous materials, would need to be disposed of through a regulated, registered hazardous waste hauler that would take the materials to a facility permitted by the Department of Health Services to accept such

wastes. Any materials disposed of in a laboratory would enter the environment through drains and fume hoods. The dilution effect upon entering the sanitary sewer system would be expected to pretreat waste compounds that are considered safe for disposal. As a result, no significant environmental impacts are expected from disposing small quantities of chemical compounds down drains. Properly designed fume hoods, with sufficient face velocity to provide proper ventilation, would protect personnel within a laboratory from harmful exposure to toxic fumes. The fumes would then be transported via the hood and duct work for dispersion within the atmosphere. If the fumes are kept to small volumes, dilution in the ambient air would not be expected to result in adverse environmental impacts from emissions (for additional discussion, refer to Section 3.2.4, Air Quality). In the event of an accidental chemical spill within a fume hood, several factors would determine the concentration of the chemicals at the point of discharge to the ambient air from the exhaust stack. These would include the concentration and volatility of the specific chemical spilled, the exact size and dimensions of the fume hood, the air flow through the fume hood at the time of the spill, and the indoor ambient air temperature.

Asbestos and Other Materials

Asbestos building siding, asbestos pipe insulation and the resulting asbestos soil contamination under pipes has also been identified within and adjacent to old buildings on the project site. The removal of these asbestos materials and contaminated soils could result in adverse health impacts to construction workers unless safety precautions were taken.

As a result of project operation, hazardous materials which might be introduced into the environment from activities other than R&D use include fertilizers, pesticides and herbicides used in landscaped areas. Additionally, hydrocarbons would be expected to be present on roadway and parking lot surfaces. These materials could be absorbed in project site runoff, entering local creeks and ultimately the Bay, increasing the load of pollutants within local drainage systems which is common within urban areas. This subject is discussed further in Section 3.2.2, Hydrology and Water Quality.

ALTERNATIVE 1: DECREASED HOUSING, INCREASED JOBS
ALTERNATIVE 2: DECREASED HOUSING, DECREASED JOBS
ALTERNATIVE 3: INCREASED HOUSING, DECREASED JOBS

The impacts identified for the project as proposed would be the same for Alternative 1 because the amount of space devoted to medical and R&D space would be the same. R&D space for Alternative 2 would be equal to the project as proposed, with a slight reduction in medical space. For Alternative 3, R&D space would be reduced 61% and medical space would be reduced 48% below the project as proposed, thus reducing the potential for use, storage, transport and disposal of hazardous materials by a corresponding amount.

MITIGATION MEASURES

PROPOSED PROJECT

Underground Fuel Storage Tanks and Land Disposal

Prior to construction or rehabilitation in specific areas on the project site that have been identified as having been contaminated as a result of underground fuel storage tanks and land disposal wastes, the project sponsor should submit to the City of Novato documentation that remedial actions have been performed in accordance with local and state regulations. In addition, the City of Novato should receive documentation regarding future surface water and groundwater monitoring if required by the Regional Water Quality Control Board, the frequency of sampling, and those responsible for conducting the sampling activities.

During construction activities that involve subsurface excavation in areas of low elevation, care should be taken by the general contractors to promote safety due to the possibility of encountering unknown underground tanks; provisions in contracts with the contractors should include procedures to be followed in the event unknown materials are encountered below grade, such as providing the project sponsor with the appropriate notifications of such finds. Upon any discovery of underground tanks during construction, tank removal procedures in accordance with local and state regulations should be adhered to.

Biomedical Research, Medical, R&D Activities

As noted previously, the operation of R&D facilities could involve the use of quantities of potentially hazardous materials. Handled inappropriately or illegally by untrained personnel, hazardous materials could prove a threat to public health and safety. Generally, however, the potential ill effects of hazards can be eliminated or reduced to

acceptable levels by overall facility design and layout, by compliance with internal operating procedures, by compliance with both federal and local governmental agency regulations, and by the implementation of procedures developed to control emergencies and accidents.

For research purposes, biomedical activities are categorized by four biosafety levels of control. Practices, techniques and safety equipment required for Biosafety Levels 1 through 4 are described in Table 3.1.8-1.

As noted in the U.S. Department of Health and Human Services, Biosafety in Microbiological and Biomedical Laboratories, March, 1984, these biosafety levels consist of combinations of laboratory practices and techniques, safety equipment, and laboratory facilities appropriate for the operations performed and the hazard posed by the infectious agents and for the laboratory function or activity.

"Biosafety Level 1 practices, safety equipment, and facilities are appropriate for undergraduate and secondary educational training and teaching laboratories and for other facilities in which work is done with defined and characterized strains of viable microorganisms not known to cause disease in health adult humans. Many agents not ordinarily associated with disease processes in humans are, however, opportunistic pathogens and may cause infection in the young, the aged, and in immunodeficient or immunosuppressed individuals.

"Biosafety Level 2 practices, equipment, and facilities are applicable to clinical, diagnostic, teaching and other facilities in which work is done with the broad spectrum of indigenous moderate-risk agents present in the community and associated with human disease of varying severity. With good microbiological techniques, these agents can be used safely in activities conducted on the open bench, provided the potential for producing aerosols is low. Primary hazards to personnel working with agents may include accidental autoinoculation, ingestion, and skin or mucous membrane exposure to infectious materials. Procedures with high aerosol potential that may increase the risk of exposure of personnel must be conducted in primary containment equipment or devices.

TABLE 3.1.8-1
SUMMARY OF RECOMMENDED BIOSAFETY LEVELS FOR INFECTIOUS AGENTS

Biosafety Level	Practices and Techniques	Safety Equipment	Facilities
1	Standard microbiological practices.	None: primary containment provided by adherence to standard laboratory practices during open bench operations.	Basic
2	Level 1 practices plus: Laboratory coats; decontamination of all infectious wastes; limited access; protective gloves and biohazard warning signs as indicated.	Partial containment equipment (i.e., Class I or II Biological Safety Cabinets) used to conduct mechanical and manipulative procedures that have high aerosol potential that may increase the risk of exposure to personnel.	Basic
3	Level 2 practices plus: special laboratory clothing; controlled access.	Partial containment equipment used for all manipulations of infectious material.	Containment
4	Level 3 practices plus: entrance through change room where street clothing is removed and laboratory clothing is put on; shower on exit; all wastes are decontaminated on exit from the facility.	Maximum containment equipment (i.e., Class III biological safety cabinet or partial containment equipment in combination with full-body, air-supplied, positive-pressure personnel suit) used for all procedures and activities.	Maximum Containment

Source: Biosafety in Microbiological and Biomedical Laboratories, U.S. Department of Public and Human Services, March 1984.

"Biosafety Level 3 practices, safety equipment, and facilities are applicable to clinical, diagnostic, teaching, research, or production facilities in which work is done with indigenous or exotic agents where the potential for infection by aerosols is real and the disease may have serious or lethal consequences. Autoinoculation and ingestion also represent primary hazards to personnel working with these agents.

"Biosafety Level 4 practices, safety equipment, and facilities are applicable to work with dangerous and exotic agents which pose a high individual risk of life-threatening disease. All manipulations of potentially infectious diagnostic materials, isolates, and naturally or experimentally infected animals pose a high risk of exposure and infection to laboratory personnel."

Four biosafety levels are also described for activities involving infectious disease activities with experimental mammals. These four combinations of practices, safety equipment and facilities are designated Animal Biosafety Levels 1, 2, 3 and 4 and provide increasing levels of protection to personnel and the environment.

Selection of an appropriate biosafety level for work with a particular agent or animal study depends upon a number of factors. Some of the most important are: the virulence, pathogenicity, biological stability, route of spread and communicability of the agent; the nature or function of the laboratory; the procedures and manipulations involving the agent; the quantity and concentration of the agent; the endemicity of the agent; and the availability of effective vaccines or therapeutic measures.

In practice, the laboratory director is directly and primarily responsible for the safe operation of the laboratory. His/her knowledge and judgment are critical in assessing risks and appropriately applying the biosafety level recommendations. The biosafety level represents those conditions under which the agent can ordinarily be safely handled. Special characteristics of the agents used, the training and experience of personnel, and the nature or function of the laboratory may further influence the director in applying the recommendations.

Hazardous Materials Handling

The storage, generation and handling of hazardous materials is regulated by the Department of Health Services. A permit is required from the Department for any facility that stores hazardous materials for more than 90 days, generates hazardous materials or disposes of hazardous materials in accordance with Title 22 of the California Administrative Code.

A Hazardous Materials Management Plan should be prepared by firms or organizations planning to use hazardous materials in their operations. The Plan should contain a description of the methods to be used for the proper storage of any hazardous materials, including primary and secondary containment and chemical segregation provisions, a hazardous materials inventory of chemicals used in the facility, an emergency and spill response program, methods of disposal and monitoring and record-keeping programs. An (internal) Emergency/Contingency Plan should be written as part of the Hazardous Materials Management Plan and maintained at the local R&D facility. The Emergency/Contingency Plan should be designed to include emergency response procedures in the event of a hazardous materials release, employee and personnel response training, hazard recognition, communication equipment to be used during an emergency resulting from fire, explosion, earthquake, vandalism and accidental release of hazardous materials, and health and safety precautions, measures to mitigate any hazards to life threatening situations, and evacuation procedures. In addition, employees should receive regular training in the use and application of the Hazardous Materials Management Plan.

Any R&D use on the project site should accurately disclose the types, quantities and uses of hazardous materials to be used as a condition of occupancy. The project Covenants, Conditions and Restrictions (CC&Rs) should be structured to provide for the shipment, storage, handling and disposal of hazardous materials in conformance with applicable local, state and federal standards and permitting procedures.

The individual facility operators, should designate the location and/or person at each facility where up-to-date information about hazardous materials present can be obtained promptly in the event of a spill incident. This information should be made available to the City of Novato and Novato Fire Department at the direction of the project sponsors prior to the use of any hazardous materials.

It should also be noted that the County has a "right-to-know" law requiring Marin businesses and agencies to disclose their use and storage of hazardous materials. The law assists fire departments by telling them where volatile chemicals are stored so they know what dangers might be confronted in firefighting. The law requires the information to be available to the public, but trade-secret information may be kept confidential at the request of businesses.

Equipment

To ensure against potential environmental impacts due to equipment failure, laboratory drains, piping and fittings should be of corrosion resistant material and fume hood duct work and fans should be of water resistant material where parts come in contact with the air stream. Fume hood stacks should be located to minimize the exposure of adjacent buildings or outdoor areas to fume hood emissions.

Airborne Contaminants

Currently, no standards have been established for chemicals presently considered toxic air contaminants by the Bay Area Air Quality Management District (BAAQMD). However, recent regulatory action would provide BAAQMD with discretionary review over specified facilities with the potential to emit airborne contaminants to the outside atmosphere. BAAQMD may require permit approval and risk assessment analyses for a particular land use. Provisions of the Marin Tanner Plan dealing with the disposal of hazardous substances would also govern the production of toxic air contaminants. In order to operate exhaust stacks at research facilities, said research facilities would be required to obtain permits from the BAAQMD.

Approval of required permit applications by BAAQMD would be dependent upon demonstrating that any release of toxic air contaminants to the environment would not result in any significant exposure to human or other populations. Computer modeling and/or risk assessment techniques, known as multi-media exposure modeling, would need to be employed in such a demonstration. If any standards would be mandated for specific chemicals, the research facility would be required to comply with the standards and implement appropriate measures to prevent the release of toxic air contaminants to the ambient air that exceed adopted standards.

Sewers

The Novato Sanitary District should review the project plans and proposed land uses prior to construction to prescribe limitations on the types and amounts of waste to be disposed of in the sanitary sewer system so as not to adversely affect sewers or treatment plant operation and determine the possible need for any traps required to separate certain materials from the sewage.

Transport

For the transport of hazardous materials to and from any R&D facilities, it is recommended that Emergency and Spill Prevention Plans be submitted to the City of Novato by R&D tenants at the direction of the project sponsors, prior to the transport and use of any hazardous materials.

The importation of etiologic (disease causing) agents and vectors of human disease is subject to the requirements of the Public Health Service Foreign Quarantine regulations. Companion regulations of the Public Health Service and the Department of Transportation specify packaging, labeling, and shipping requirements for etiologic agents and diagnostic specimens shipped in interstate commerce. The U.S. Department of Agriculture regulates the importation and interstate shipment of animal pathogens and prohibits the importation, possession, or use of certain exotic animal disease agents which pose a serious disease threat to domestic livestock and poultry.

Asbestos Removal

Human exposure to asbestos removal during construction activities is regulated by the Environmental Protection Agency and the Occupational Safety and Health Administration through the National Emissions Standards for Hazardous Air Pollutants (40 CFR Part 61, Subpart M), and Toxic Substances Control Acts (29 CFR Part 1910). On the state level, asbestos is listed as a hazardous material in Title 22 of the California Administrative Code, and must be handled accordingly. For the health and safety of future residents in the WAF Hill area, additional inspections should be conducted to accurately determine the extent of asbestos contamination for cleanup planning purposes prior to construction, and clean-up activities conducted in accordance with existing regulations.

For the mitigation of potential airborne contaminants, refer to Section 3.2.4, Air Quality.

ALTERNATIVE 1: DECREASED HOUSING, INCREASED JOBS

ALTERNATIVE 2: DECREASED HOUSING, DECREASED JOBS

ALTERNATIVE 3: INCREASED HOUSING, DECREASED JOBS

Mitigation relating to hazardous materials as would be required for the proposed project would apply equally to Alternatives 1, 2 and 3.

¹ A hazardous material is defined as a substance or waste, or combination of such materials, which because of its quantity, concentrations, physical or chemical constituents, or infectious characteristics, may cause or significantly contribute to an increase in mortality or serious irreversible illness, or may pose a substantial present or potential hazard to human health or environment, when improperly used, handled, treated, stored, transported, disposed of or otherwise managed.

A hazardous substance is defined as a hazardous material which has commercial value and is not a waste product of an industrial or other process.

A toxic substance is defined as any chemical, when present in excess of threshold concentrations, causes harmful biologic effects in living organisms.

² Alex Macievich, Engineer, Department of Defense, Presidio of San Francisco, personal communication, July 23, 1986.

³ Woodward-Clyde Consultants, Hamilton Air Force Base, GSA Sale Area, Confirmation Study for Surface and Subsurface Hazardous Materials Contamination, Final Report, October 25, 1985.

⁴ Ibid, page 2-5.

⁵ U.S. Army Corps of Engineers, Sacramento District, Hamilton Air Force Base, Novato, California, Proposed Remedial Action and Remedial Investigation Plan--Sale Property, 16 December, 1985, Revised December 17, 1985.

⁶ Department of the Army, Office of Assistant Secretary, letter to Mr. Earl E. James, Acting Commissioner, Federal Property Resources Services, GSA, from Mr. John W. Shannan, Asst. Secretary of the Army, May 9, 1985.

SUMMARY COMPARISON OF IMPACTS AND MITIGATION MEASURES

3.1.8 HAZARDOUS MATERIALS

	IMPACT	MITIGATION
PROPOSED PROJECT	<ul style="list-style-type: none"> * During construction or site grading, underground fuel storage tanks could be discovered. * Operation of R & D and light industrial facilities could utilize hazardous or toxic materials in their research and / or manufacturing operations. Quantities of hazardous substances that would be used cannot be determined at this time. 	<ul style="list-style-type: none"> * Remove any discovered tanks and clean up area as per State and local regulations. Provide provisions in contractor contracts to be followed if below grade hazardous materials are found. * The storage, generation and handling of hazardous materials is regulated by the Department of Health Services. Project CC & Rs should establish requirements for compliance with applicable regulations. Firms should prepare hazardous materials Management Plans.
ALTERNATIVE 1: (Decreased Housing, Increased Jobs)	<ul style="list-style-type: none"> * Impacts would be the same as for the proposed project. 	<ul style="list-style-type: none"> * Mitigation would be the same as for the proposed project.
ALTERNATIVE 2: (Decreased Housing, Decreased Jobs)	<ul style="list-style-type: none"> * Impacts would be the same as for the proposed project. 	<ul style="list-style-type: none"> * Mitigation would be the same as for the proposed project.
ALTERNATIVE 3: (Increased Housing, Decreased Jobs)	<ul style="list-style-type: none"> * R & D space would be reduced 61% and medical space would be reduced 48% below the proposed project, thus correspondingly reducing the use, storage, transportation and disposal of hazardous materials. 	<ul style="list-style-type: none"> * Mitigation would be the same as for the proposed project.

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3.1.9 VISUAL QUALITY

SETTING

Hamilton Field is located in southeast Novato, approximately four miles south of the City's Central Business District. The project area serves as the southern "gateway" to Novato due to its setting in the landscape and its location along heavily travelled U.S. Highway 101.

The project site has historically and visually formed part of a physical transition zone between the Marin County hills to the west and the San Pablo Bay marshes and wetlands to the east. In fifty years of military ownership, however, the site has undergone significant site grading and development. Approximately 90% of the 452-acre project site has been transformed in one way or another. The greatest visual changes have been the result of extensive hillside cutting, filling, excavation, and the construction of roads, buildings, and flood control structures (see Figure 3.1.9-1, Existing Conditions). Many of the existing buildings and roads are in a blighted condition (see Figures 3.1.9-2 and 3.1.9-3, Blighted Conditions).

The site is visually complex and diverse as a result of past and current land use activities and site elements. Military buildings include aircraft hangars, single- and multi-story offices, multi-story housing, warehouses, service and recreation facilities. Many of these buildings reflect Neo-classical, Spanish/Mission styling and detailing. Other elements such as runways, roads, munitions bunkers, fuel tanks, water towers, power lines, and antennas are points of reference both within and beyond the project boundaries. Landforms consist of rolling hills and relatively flat plains which are covered with grasses and madrone and oak trees. A portion of Pacheco Creek and its riparian corridor traverse the site; in addition, San Pablo Bay is part of Hamilton Field's "extended landscape," that is, San Pablo Bay visually extends the site beyond its true boundaries.

Views

Ammo Hill, Reservoir Hill, WAF Hill, and Christmas Tree Hill are the most visually prominent topographic features at Hamilton Field. The hills have been graded during previous military activities at Hamilton Field, and therefore the hill forms cannot be considered as natural; the afternoon sun highlights graded cuts and side slopes of the hills



View of Reservoir Hill looking East from Aberdeen Road.



View of Ammo Hill taken from Igloo Hill Road.

HAMILTON FIELD MASTER PLAN EIR

EXISTING CONDITIONS





View of Building #836.



View of Building #831.

HAMILTON FIELD MASTER PLAN EIR

BLIGHTED CONDITIONS



FIGURE 3.1.9-2



View of Building #666.



View of Building #690 from West side of tracks.

HAMILTON FIELD MASTER PLAN EIR

BLIGHTED CONDITIONS



FIGURE 3.1.9-3

3-277

SOURCE: BERG-REVOIR CORPORATION

from U.S. 101 and areas on the site west of the hills. Ammo Hill, at an elevation of 162-feet, is the tallest and most distinctive of the hills. Views to the site from U.S. Highway 101 (northbound), Nave Drive, and Alameda del Prado focus on Ammo Hill, due to its height, slope, aspect, and setting in the landscape -- it is set apart from the other hills on a relatively flat and open portion of the site. Ammo Hill is especially apparent during the dry season when the hill's beige grasslands contrast with the clusters of dark green madrone and oak trees (Figure 3.1.9-4).

The tallest buildings on the project site, the 55- to 60-foot high BOQ structures within the Old Headquarters area, generally cannot be seen from off-site areas. The Old Headquarters area complex is screened from the U.S. 101 corridor by WAF and Reservoir Hills. The Old Headquarters area buildings are screened from view from the south by hillsides including Hospital Hill. The area is further screened from the north by Pacheco Creek vegetation and Ammo, WAF and Reservoir Hills. The Old Headquarters area is screened from the east by the hangar buildings and Reservoir Hill.

Reservoir Hill is 142-feet in height and is located east and slightly south of Ammo Hill. Prior to their recent removal (see Section 3.1.8, Hazardous Materials), fuel tanks were prominent features on Reservoir Hill. Two 3-story white concrete buildings and associated graded roads which are situated on the west flank of the hill remain today and are visible from off-site areas. Reservoir Hill has fewer trees than Ammo and WAF hills; grass-covered slopes contrast with the madrone and oak trees scattered along the hill's slopes.

WAF Hill is south of State Access Road, and south but slightly west of Reservoir Hill; its top elevation is approximately 101 feet. Abandoned 1- and 2-story barracks serviced by graded roadways are visually prominent on WAF Hill.

Christmas Tree Hill is a road-cut rock outcrop, approximately 70 feet in height, located along Nave Drive at the intersection of Nave Drive and State Access Road. The hill is dominated by a steep cut face when viewed from the west such as U.S. 101 and Nave Drive. The hill does not support woodland growth and blocks views to the interior of Hamilton Field from locations west of the site (Figure 3.1.9-5). The name Christmas Tree Hill is given because of its annual use as the pedestal for the Hamilton Christmas Tree.



**HAMILTON FIELD
MASTER PLAN
EIR**

**VIEW OF SOUTH SLOPE
AMMO HILL
FROM PROJECT SITE**



FIGURE 3.1.9-4

3-279

SOURCE: BERG-REVOIR CORPORATION



**HAMILTON FIELD
MASTER PLAN
EIR**

**VIEW LOOKING EAST
FROM ALAMEDA DEL PRADO**

FIGURE 3.1.9-5

3-280



SOURCE: EIP ASSOCIATES

The most visually prominent man-made features associated with Hamilton Field are a 250,000 gallon water tank and Navy communications antennae located west of WAF Hill. Both are situated on the top of a hill on Navy property, just outside the project boundaries. The water tower is painted in a red and white checkerboard pattern to warn low-flying aircraft of its presence. The vertical configuration of these elements contrast with the lower profile of the project site's architectural elements. The water tower is viewed both off- and on-site and is a familiar landmark for southbound travellers on U.S. Highway 101.

Overall, the most visible elements on the project site are the abandoned white barracks buildings on WAF Hill, the white concrete buildings on the west flank of Reservoir Hill and the cut slopes, ammo embankments, and white buildings on Ammo Hill.

Motorists travelling northbound on U.S. 101 view portions of the project site. The first view of the site is from the crest of the pass north of the Alameda del Prado/U.S. 101 interchange. The tops of Ammo and Reservoir Hills are briefly visible before trees bordering Nave Drive block the view. Further north, the site is viewed briefly along 101 prior to being blocked by Christmas Tree Hill. The view available to motorists driving south is of the west end of Ammo Hill and of west facing slopes of Reservoir and WAF Hills. At speeds of 50 mph this view is available for approximately 12 seconds.

The site is most visible from the neighborhood west of U.S. 101. The center of the open central area of Hamilton Field can be seen for approximately 2,000 feet along Alameda del Prado. The Central area is also visible from the top of the Ignacio/U.S. 101 interchange, north of the project site.

Residents on the north edge of the Lanham housing project, and people driving along State Access Road, have views directly into the future development area of the site. Currently, some views are blocked by Navy buildings. Views to Hamilton Field from the Los Robles Mobile Home Park and Bel Marin Keys business park, northwest of the site, are screened by dense vegetation which occurs along the property line. Limited views to the north and west slopes of Ammo Hill are available.

Distant views to the site from homes built on south-facing hill slopes near central Novato are of Ammo Hill. The hill can also be seen from Highway 101 south of the De Long interchange. From Highway 37 west of Black Point, the tops of Ammo Hill and Reservoir Hill can be seen. Because these hills are viewed against a backdrop of higher westerly hills off the project site, their prominence is diminished. Aircraft hangars are visible when morning and late afternoon sunlight reflect off of the structures.

Ammo Hill, Reservoir Hill, and the aircraft hangars in the Hangar Row area are visible from streets and residences which are sited on the south and west keys of the Bell Marin Keys residential community, northeast of the project site.

Site Architecture

Hamilton Field reflects the orderly site layout characteristic of a military facility. The straight, formal circulation system is reinforced by buildings and vegetation which align with the street pattern. This sense of formality and order contrasts where the irregular topography of the site occurs.

Buildings on the site reflect Federalist, Neo-classical, and Spanish/Mediterranean architectural styling and detailing. Typically, buildings on the site are painted white, including wooden barracks, aircraft hangars, munitions warehouses, hospital, chapel, and military headquarters. In the Old Headquarters area, white stucco buildings with clay tile roofs are ornately detailed (Figure 3.1.9-6). Architectural themes on-site are reflected in the main gate structure located on Main Gate Road adjacent to Nave Drive (Figure 3.1.9-7). Aircraft hangars, in the Hangar Row area, are typical examples of functional architecture.

Building architectural unity is achieved in the Old Headquarters area through a Spanish/Mediterranean architectural theme. The more modern military buildings of the Navy Commissary of Capehart Housing are simple in form, lack architectural detailing and do not visually complement or carry out the Spanish/Mediterranean theme of the Old Headquarters area.



**HAMILTON FIELD
MASTER PLAN
EIR**

**TYPICAL ARCHITECTURE
IN OLD HEADQUARTERS AREA**

FIGURE 3.1.9-6

3-283



SOURCE: EIP ASSOCIATES



**HAMILTON FIELD
MASTER PLAN
EIR**

HAMILTON MAIN GATE

FIGURE 3.1.9-7

3-284



SOURCE: EIP ASSOCIATES

Novato General Plan

The Novato General Plan includes discussions and policies which relate to visual quality issues in Novato. The Natural Environment Element calls for the preservation of environmental qualities which have attracted people to Novato. Qualities to be preserved include open space and greenbelt areas, the hills, ridgelines and wetlands and creek areas. Natural Environment Policy NE-2 discusses the control of earth grading by the City to minimize the visual impacts of cut and fill slopes. The City will not permit excessive grading, side hill cuts and daylighting (grading at the top) of ridges and knolls for development purposes.

Policy NE-7 refers to the Open Space Plan Map 2-2 which shows areas that have significant open space and resource value. Specific features to be preserved include ridgeline and hillside views, near and far away views, Bay plain and shoreline views, creeks, rock outcroppings, and other significant features. The Open Space Plan Map shows Ammo and Reservoir Hills on the Hamilton Field site as having important open space and resource values. Scenic Lands Map 2-10 in the Novato General Plan identifies these hills as "Scenic Hills and Ridges."

The Novato General Plan includes a Scenic Highway Element. Highway 37, between U.S. 101 and Vallejo is recognized as a scenic highway for local planning purposes, however, it has not been designated as an official State scenic highway. Highway 101 is discussed as a locally-defined scenic route. The Highway 101 corridor is important to Novato as it provides the major visual experience of Novato for thousands of freeway users on a daily basis. This visual experience creates an image of Novato and in order for that image to be a positive one, extreme care must be exercised in planning the location, density, and design of future land uses along the corridor.

IMPACTS

PROPOSED PROJECT

This analysis addresses the Master Plan proposal in the form in which it was submitted to the City of Novato. The proposed Hamilton Field project would be a mixed use development as explained previously (see Section 2.4, Project Characteristics and Scheduling). Approximately 500 residential units would be located at the base of or upon

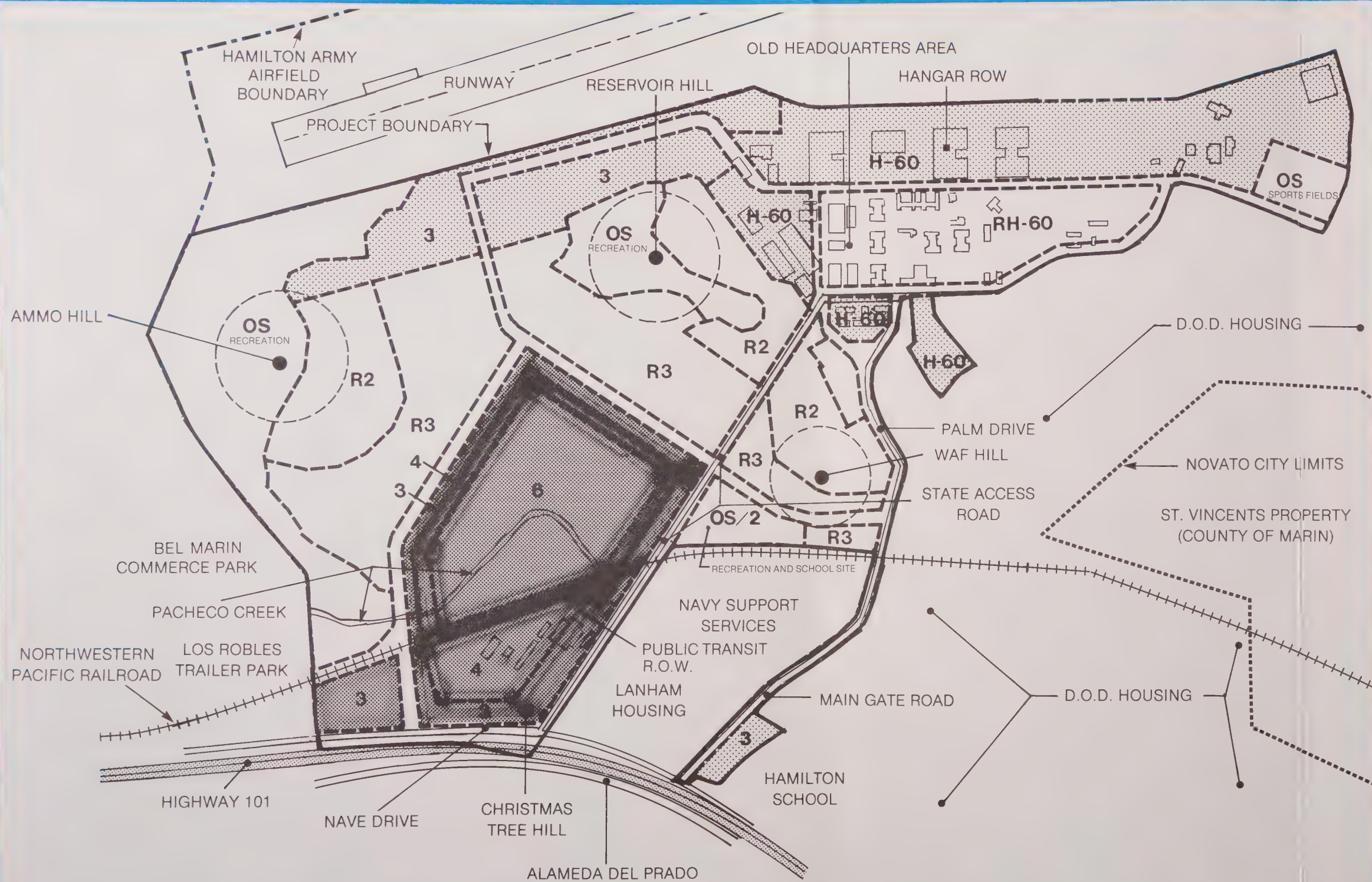
the lower elevations of Ammo and Reservoir Hills, and WAF Hill, with the remaining units located in the nearby flat topography in close proximity to the central core area and the Old Headquarters area. About 550 units of retirement rental housing would be constructed in the Residential Historic area west of Hangar Row as shown on Figure 3.1.9-8, Building Heights Map. The retirement rental housing would extend up to a maximum height of 60 feet, generally about equal in height with the existing hangars and other buildings of the Old Headquarters area. The construction of new office and R&D buildings, limited to six floors (60 feet), would also occur in portions of the Old Headquarters area. In the Central area, southwest of Ammo Hill as shown on the Building Heights Map, new building construction would be six stories in height surrounded by progressively lower structures four and three stories in height. About 41% of the site (183 acres, not including roads and open space), would be developed for offices, warehousing and R&D use.

About 16% of the site would be retained in open space inclusive of 12.8 open space acres on Reservoir and WAF Hills, 22.9 acres of recreation open space on Ammo Hill, 23.9 acres of wetlands open space near the base of Ammo Hill, and 11.9 acres of community open space.

Urban Design Framework

The urban design framework for Hamilton Field would be built around two contrasting site forces. Because of its military history, the currently developed portions of the site are very formal and ordered; in contrast to this, the dominant topographic features of the site, Ammo Hill, Reservoir Hill and WAF Hill, are visually irregular. An objective of the urban design framework as developed by the project sponsors is to respect each force and to build upon the character and the strengths of these existing features of the site.

Seven distinct spatial zones or topographic features have been identified on the site (Figure 3.1.9-9). The zones are: The Old Headquarters area, Hangar Row, The Central area, The Runway Edge, Reservoir Hill, WAF Hill, and Ammo Hill. The project urban design concept recommends that each of the existing zones have its own individual distinction, resulting in development neighborhoods. The neighborhoods are proposed to be linked by an orderly corridor system of streets, pathways, and landscape spaces.



HAMILTON FIELD MASTER PLAN EIR

FIGURE 3.1.9-8

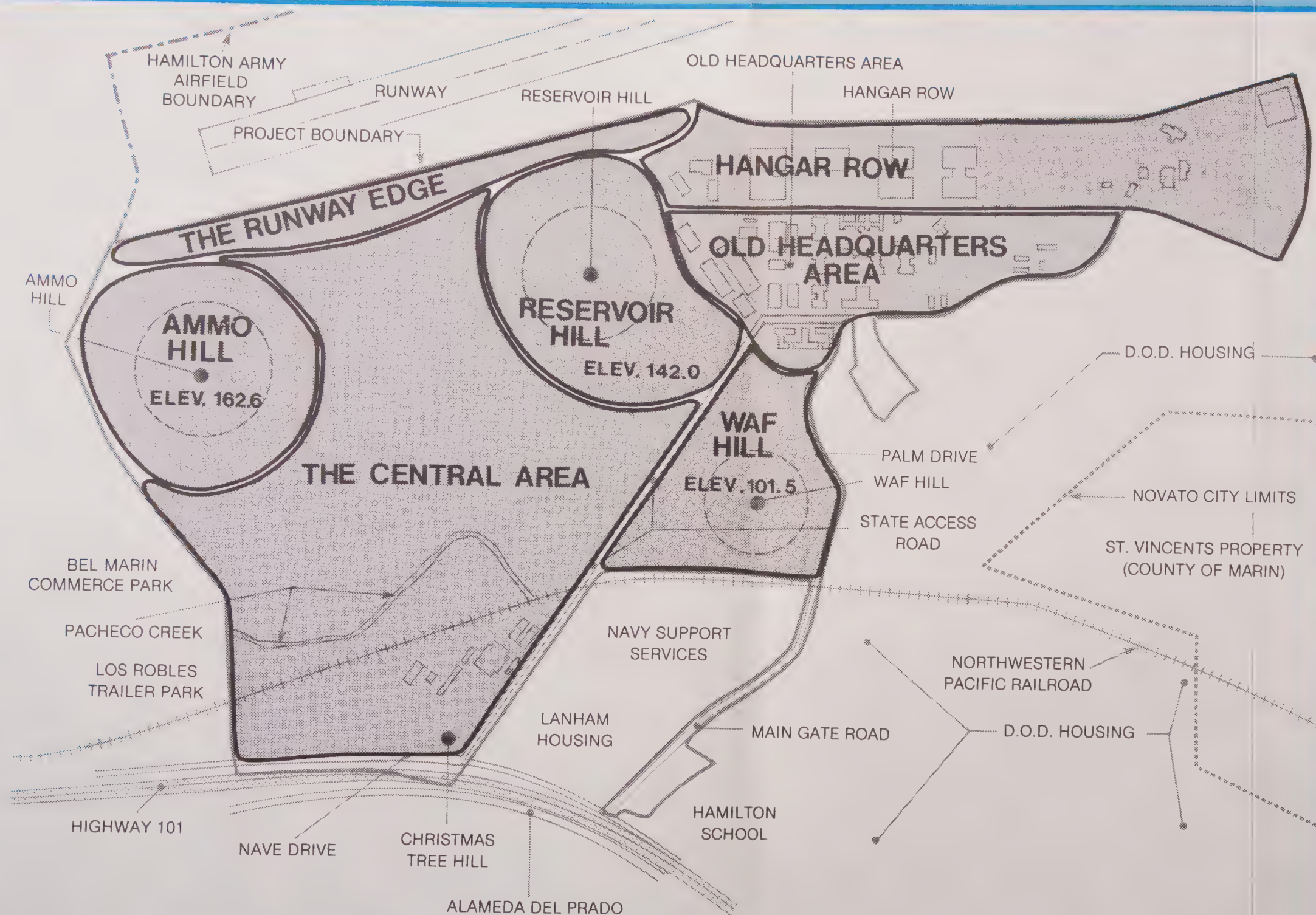
- H-60** Historic Area
60' Maximum Height
- RH-60** Residential Historic Area
60' Maximum Height
- R2** Residential / 2 Floors
Maximum Over Parking
- R3** Residential / 3 Floors
Maximum Over Parking
6 Story Maximum for Retirement Housing
- 3** Three Floors Maximum
- 4** Four Floors Maximum
- 6** Six Floors Maximum
- OS** Open Space
- OS/2** Open Space /
Recreation / School Site
- 0.60 Floor Area Ratio
- 0.50 Floor Area Ratio

BUILDING HEIGHTS

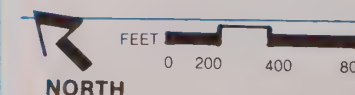


HAMILTON FIELD MASTER PLAN EIR

FIGURE 3.1.9-9



SPATIAL ZONES



eip

SOURCE: BERG-REVOIR CORPORATION

Site circulation is intended to take advantage of existing routes and would partially rely on the construction of new routes. Main Gate Road and State Access Road would continue to provide access to the site, however, primary access would be via a new entrance road north of State Access Road. The formal (grid-like) road pattern in the Central area would be reflective of existing military streets in the Old Headquarters area. The new major entrance road would be boulevard-like in character, with a center landscaped median and bicycle lanes on each side. Streets on the flatter portions of the site would be orderly while streets which provide access to the hills would be more informal and meandering in response to existing variations in topographic conditions.

The dominant structures of the project would be patterned after the physical organization of the Old Headquarters area where the grid street system is strengthened by the buildings which are aligned with the streets. In the Central area, the new "entrance boulevard" would establish a spatial pattern of structures and spaces arranged to adhere to the street alignments. Landscaped spaces would be located at right angles to primary roads. This core of development and landscaped spaces would be the population center of the project.

The spatial organization of structures in the Old Headquarters area would adhere to the existing pattern of development. Characteristics of this Spanish-Mediterranean pattern include clustered buildings with landscaped courtyards within the building groupings, and arcades which shelter pedestrian corridors. Where possible, this character would be repeated on other portions of the site to create enclosed, sheltered spaces, oriented to a southern solar aspect.

Landscape Framework

Landscape elements would give emphasis to the contrasting site development patterns of order and irregularity. Orderly tree patterns would parallel major streets and building groupings in the new development and Old Headquarters area. Plantings on the hills and along the north edge of the property would reflect the massing of existing trees. Some wetlands on the site would be removed during construction of the project and replaced on an acre-for-acre basis (see Section 3.2.3, Vegetation and Wildlife). Portions of riparian wetland will be relocated and augmented with more diverse plantings of Willow, Oak Alder, Big Leaf Maple, California Sycamore and understory plantings.

Edges of the proposed project would be planted with different landscape treatments. In some instances screening is important, in others, visual transparency is more appropriate. For example, along the U.S. 101 frontage, trees would be planted to frame views of the project. A limited corridor of existing vegetation would be retained and/or augmented along the North edge of the project to maintain a visual separation between adjacent land uses and the project. The area adjacent to the marsh would be designated as open space and new vegetation would be added. The runway edge would receive low, seasonal wetland plantings as tall vegetation is prohibited by airport safety regulations.

The Old Headquarters area is defined by an oak covered hillside located on adjacent Navy property to the south. Escolta Avenue and Palm Drive are roads in the area with Palm trees being the dominant ornamental vegetative type. Additional trees appropriate to the character of the Old Headquarters area would be installed as needed to further define the project edge. Tree planting in the Old Headquarters area would enhance the existing order of the street system and continue the use of Palm, Camphor and Ash trees.

The State Access Road edge would be landscaped on its north side to separate existing uses from new development. Because the right of way is narrow, space for planting on the south side of State Access Road is limited. Street trees would be planted along the south side if space is available. The existing trees on the south side of State Access Road would be retained as a buffer for Lanham Village.

Landscape planting the interior of the project site would consist of trees shrubs and groundcover. Parking lots would be planted with trees to shade paved surfaces, to reduce the scale of the parking areas, and to direct pedestrians to buildings. Revegetation of steep hill slopes with native trees and shrubs would be provided to reduce the visibility of proposed hillside structures.

Development Criteria

Buildings in new development areas would be designed and constructed in response to the function of the structure. Scale, in relation to the human figure, would be achieved through control in the size of windows, entrances and other fenestration. New buildings in the Old Headquarters area would achieve visual consistency and compatibility with new and older buildings. Guidelines would be prepared with the intention of achieving overall project composition and harmony in the use of a Spanish/Mediterranean design theme.

Residential units, also designed using the Spanish/Mediterranean theme, would have textured exterior surfaces, generally white or light earth tone colors and pitched clay or concrete tile roofs to achieve visual compatibility with the hill forms and other existing military Spanish/Mediterranean architecture, including military Spanish housing south of the Old Headquarters area.

Development of the Hamilton Field site would require topographic modification. Site grading would include:

- o Fill as needed to achieve flood protected building sites in low lying areas.
- o Cutting, filling and recompaction as needed for roadways and parking areas and regrading of hillside cuts.
- o Shaping of ground surfaces in landscaped areas for proper surface drainage and aesthetic purposes.
- o Removal of Christmas Tree Hill with regrading of the frontage area parallel with Nave Drive to gain development area.
- o Modification of limited areas of hillside slopes to accommodate residential structures.

Utilities on the project site, with the exception of the existing PG&E transmission lines, would be placed underground in easements adjacent to or within street rights-of-way.

Project Impacts

Visual quality and the aesthetic value of the project site in its current condition is a subjective judgement by the observer of the site. Correspondingly, visual impact at full buildout of the site would be measured by the amount of visual change affecting the site's aesthetic value. Visual impact would also include the compatibility of the visual change of the site to the surrounding environment. The visual impacts of the developed site would be derived from project site grading, the physical layout of buildings with respect to slopes, building bulk and height, the density of building placement, site landscaping, parking areas and other features of site development. The proposed project would change views of the site from surrounding areas. Existing vacant, worn and abandoned military structures and site features would be demolished to make way for residential, office, and R&D buildings. Portions of land where there currently are no buildings would be occupied

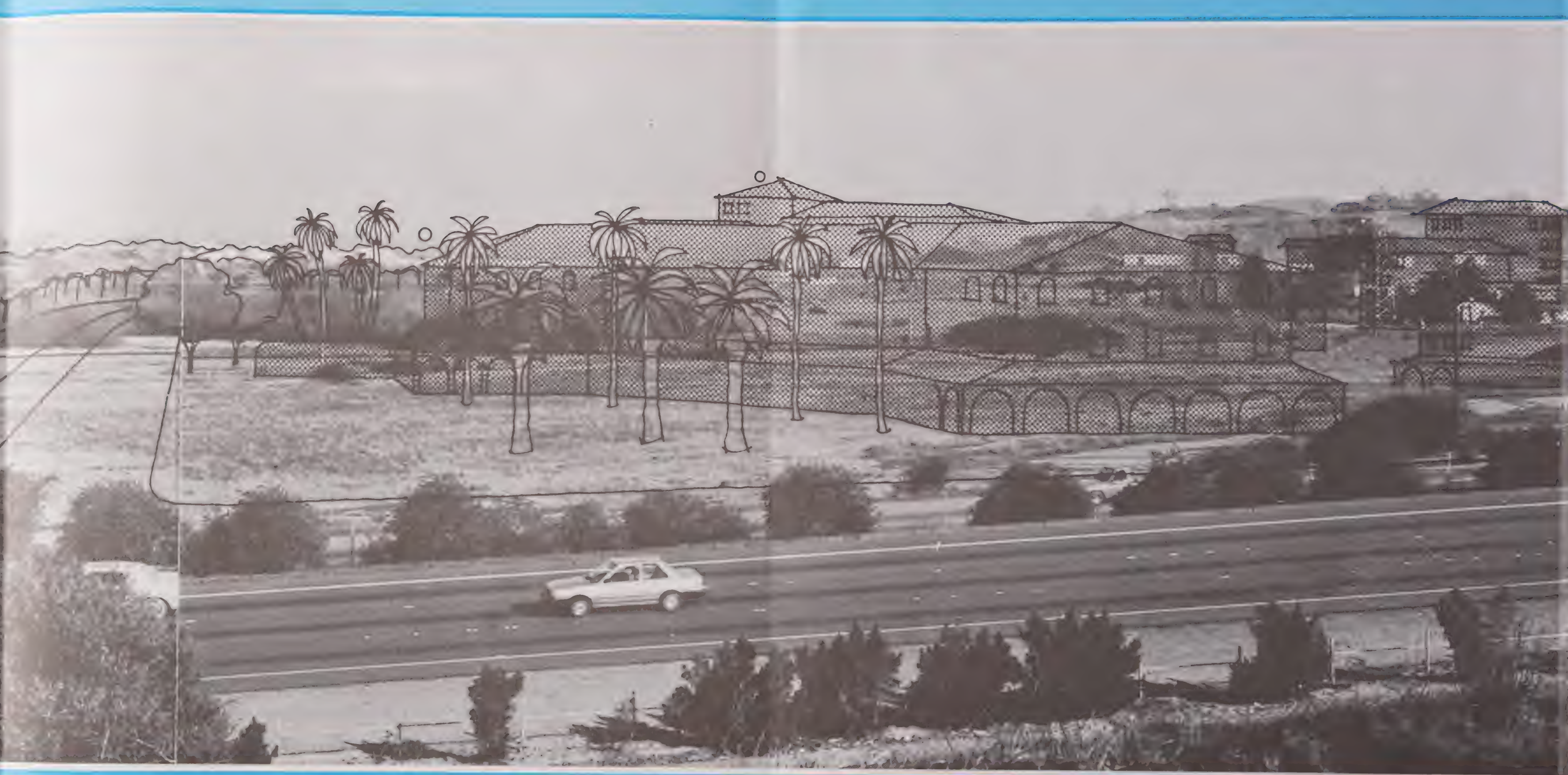
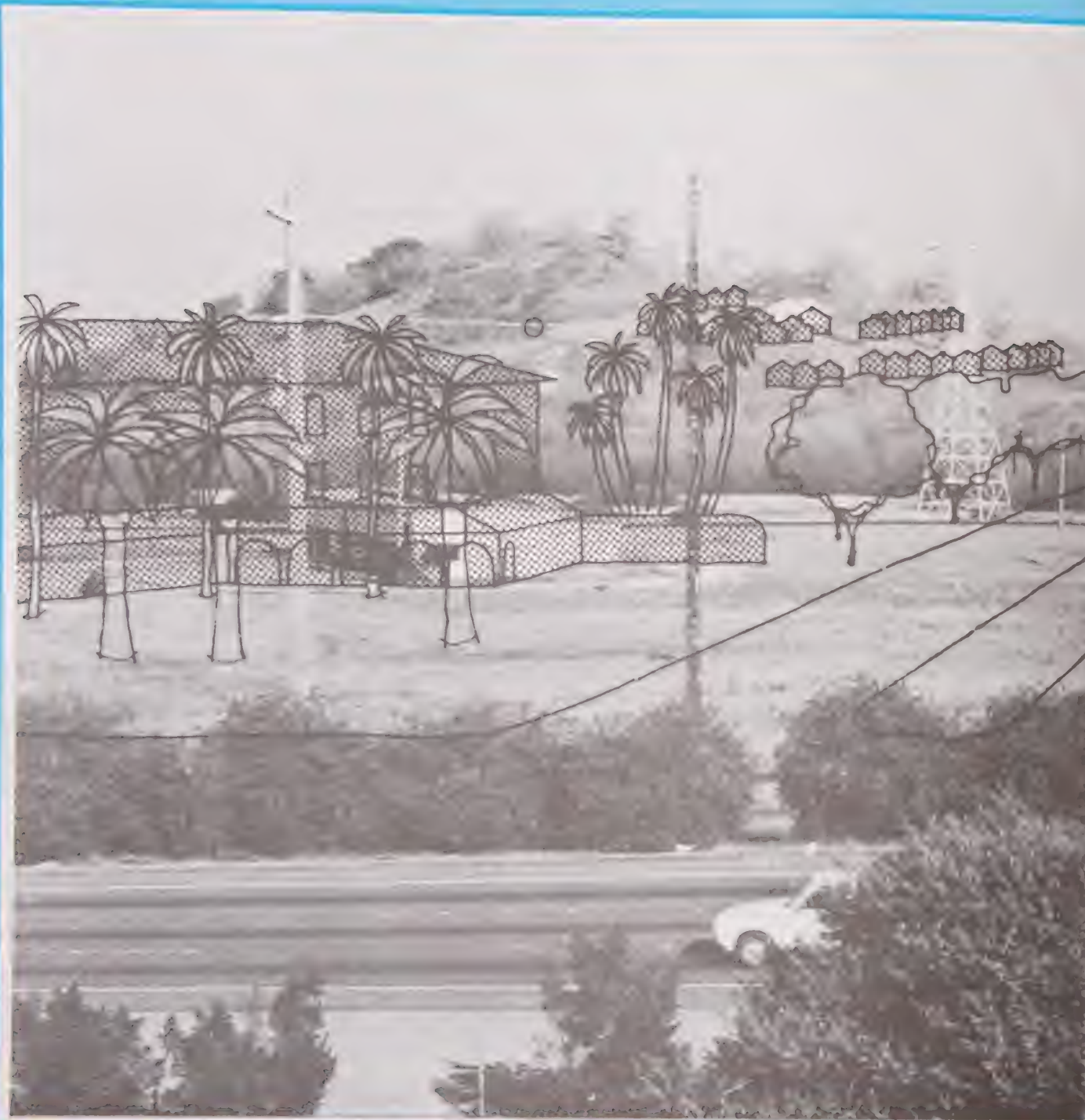
by 3- to 6-story structures, and, vegetation on the site's hills would be altered by construction activities and reinforced by the addition of plantings. Christmas Tree Hill would be removed as noted above and used for fill elsewhere on the site; portions of Pacheco Creek would be relocated; most of the wetlands would be retained with approximately six acres filled and replaced within the site. No significant impact to off-site views would be anticipated by the wetlands restoration activity.

When viewed from surrounding areas, portions of the site that are not now intensively developed are perceived as passive landscapes. Hills are distinct because of their simple form and vegetation. Site elements are generally not obtrusive, except existing buildings and features such as fuel tanks and barracks which are located on the hills. Ammo and Reservoir Hills would be retained with no development along the ridge lines. Construction on the lower hillside slopes would create a visually more complex setting than if construction were not to occur on lower hillside slopes. However, the large, box-like buildings currently located on WAF Hill would be removed and replaced with structures and landscaping stepping up the hill slopes.

The following discussion examines visual impacts of the Hamilton Field project as proposed by the project sponsor from specific locations.

Alameda del Prado

Alameda del Prado is located west of the project site, across Highway 101. Figure 3.1.9-10 illustrates views with and without the project. Background views from Alameda del Prado to San Pablo Bay would not be impacted by the project; however, the project would change middleground and foreground views. Ammo and Reservoir Hills would be within the middleground area. As shown, the hills would no longer be simple forms with distinct vegetation, rather, they would become visually more complex, indicative of a populated community. In the foreground, office and R&D buildings of from 3 to 6-stories would be visible, with the six-story structures generally situated behind (inward of) the lower buildings. Further south of the photograph location for Figure 3.1.9-10, Christmas Tree Hill, a familiar feature to area residents, would be removed and allow views to the interior of the site, which otherwise would be blocked by the hill form. Accordingly, the extent of urban development viewed from area roadways would be greater than if Christmas Tree Hill were to remain in place. However, views to the site's interior would



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FIGURE 3.1.9-10

VIEW OF NORTH PROJECT
(NEW MAIN ENTRANCE ROAD)
FROM ALAMEDA DEL PRADO

be controlled through earth berming and the planting of vegetation (see the Mitigation portion of this section).

Alameda del Prado Interchange

Views to the north from the Alameda del Prado interchange would not change substantially with the proposed project. This would be due to existing and proposed landscaping which would screen and filter views to the project site. Some residential development on Ammo Hill would be expected to be visible in the distance from the interchange area.

Posada del Sol

Posada del Sol is located west of the project site across U.S. 101. Views from this street to the project site would be of the open central area, Ammo Hill, Reservoir Hill and WAF Hill. Currently, the site's relatively open grassland character would appear to be an extension of the Posada del Sol area, thus providing an "extended landscape" view. The project as proposed, would alter views from this location. Middleground views would appear to be more complex.

State Access Road and Lanham Housing

Figure 3.1.9-11 shows views from State Access Road near the Lanham Housing area, located adjacent to the project. This figure illustrates the difference in views with the project resulting from the removal of Christmas Tree Hill and the replacement of existing structures with 3- to 4-story office and R&D buildings, and associated landscaping. It should be noted that the trees shown in Figure 3.1.9-11 are of a stature that would be gained 15 to 20 years after planting.

Nave Drive

Nave Drive parallels U.S. 101 and forms the west edge of the project site. Views to the site's interior from Nave Drive are currently limited due to peripheral site vegetation and Christmas Tree Hill. Although not necessarily representational of all views from Nave Drive, Figure 3.1.9-12 illustrates the view into the north portion of the site from a location near the new main access road. Foreground and middleground views would be changed by the project. Background views of Ammo and Reservoir Hills would disappear,

and the visual complexity of the view and the landscape would appear to be urban in character. Foreground landscaping and buildings would screen views to buildings on interior flatland areas of the site when viewed from Nave Drive.

Los Robles Mobile Home Park

Los Robles Mobile Home Park is located northwest of the project site. Currently, views to the west slopes of Ammo Hill and Reservoir Hill are considerably filtered by trees planted throughout the mobile home park and along its edges.

With the project, views to Ammo Hill from the mobile home park would encompass the undeveloped top of Ammo Hill, as well as some residential units that would be constructed on the west sides of Ammo Hill.

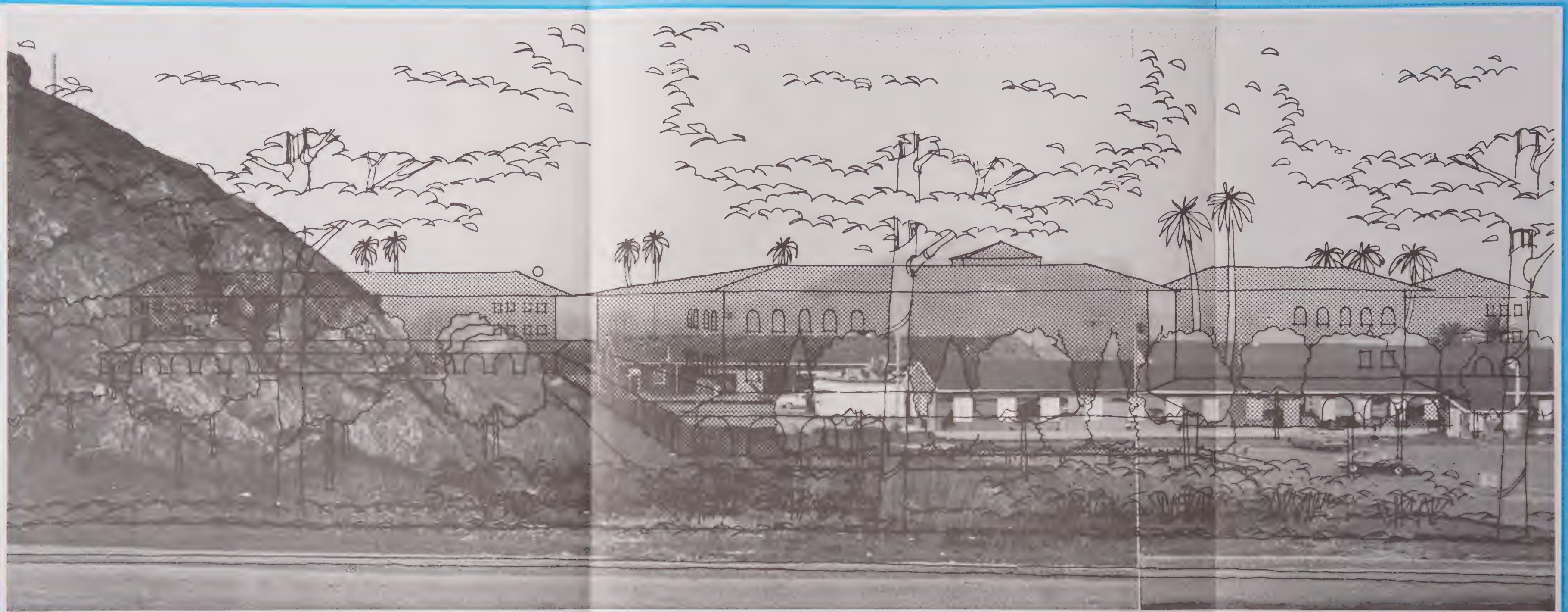
Ignacio Overpass

The Ignacio Boulevard overpass, which crosses over U.S. 101, is located above the Los Robles Mobile Home Park (Figure 3.1.9-13). From the overpass, views to the site are of the northwest to west slopes of Ammo and Reservoir Hills. As in the above discussion, views from the Ignacio overpass to Ammo Hill by pedestrians and motorists using the overpass would encompass the undeveloped north slopes of Ammo Hill as well as residential units that would be constructed on the lower west slopes of Ammo Hill.

As shown on Figure 3.1.9-13, views from the overpass would also encompass structures up to six stories in height within the inner central core portions of the project area, increasing the perceived extent of urban development over existing conditions.

Bel Marin Business Park

The Bel Marin Business Park is adjacent to the Los Robles Mobile Home Park and Ammo Hill's west slope. Most establishments in the Business Park have their views to Ammo Hill blocked by intervening buildings and vegetation. Correspondingly, Ammo Hill blocks views into the project site, and these grasslands and oak trees that are visible give the impression of a pastoral scene (Figure 3.1.9-13). Development on Ammo Hill's west slope would partially reinforce the sense of urban development on the project site when seen from service areas and cul-de-sacs of the west area of the Business Park.



HAMILTON FIELD
MASTER PLAN
EIR

FIGURE 3.1.9-11

VIEW NORTH FROM STATE ACCESS ROAD
NEAR CHRISTMAS TREE HILL



HAMILTON FIELD
MASTER PLAN
EIR

FIGURE 3.1.9-12



VIEW NORTH OF PROJECT AREA
NEAR NEW MAIN ENTRANCE ROAD
FROM NAVE DRIVE



HAMILTON FIELD
MASTER PLAN
EIR

FIGURE 3.1.9-13

VIEW OF PROJECT
FROM IGNACIO BOULEVARD OVERPASS

Bel Marin Keys

Bel Marin Keys is a residential community located northeast of the site. Views to the project site from residences located on the south keys (Unit 4), and which face south or west are primarily of the aircraft hangars, the north slope and portions of the northeast slopes of Ammo Hill, Reservoir Hill, and lowlands between the two hills (Figure 3.1.9-14). The project site forms the middleground view from Bel Marin Keys; distant hills to the south form the background view.

The proposed project would remove the fuel tanks, metal ready hangers and associated structures currently visible from southwest Bel Marin Keys. Proposed construction would not include the east or north sides of Ammo Hill. Any construction on the lower east side of Reservoir Hill would be visible, but would be mitigated by the presence of landscape plantings over time. Background views of distant hills would not be impacted by the project.

Highway 37

Highway 37 is located north of Bel Marin Keys, approximately one mile from the project site. The California Scenic Highways Master Plan includes Highway 37 (from U.S. 101 to Vallejo), in its Master Plan although the highway is not an officially designated State Scenic Highway.

Hamilton Field is visible from Highway 37 when travelling either east or west. Ammo Hill, Reservoir Hill, aircraft hangars and control tower, the checkered water tower, and telecommunications antenna are most visible from Highway 37.

Views to Hamilton Field from Highway 37 would change as a result of the project. Some development would be visible in the background. Views of distant hills would not be affected by the project.

U.S. 101

U.S. 101 is the north-south freeway corridor in Marin County. It is proposed that Christmas Tree Hill be removed, which would result in an increase in the amount of time the site would be viewed (view duration) when travelling northbound along U.S. 101.

Views to the interior of the site, particularly the office and R&D areas would become available with the removal of Christmas Tree Hill. In addition, the proposed primary entrance to the project site would be visible.

Three-story residential buildings on the south and west slopes of Ammo Hill, west slopes of Reservoir Hill and all of WAF Hill would be briefly and intermittently visible from U.S. 101. Views of the hills would vary depending on viewer location along U.S. 101 and the extent of building development along the highway which could block views to the site's interior. The visual character of portions of Ammo and Reservoir hills would be changed by the addition of residential development. Buildings currently exist on the slopes and top of WAF Hill. Removal of the existing structures on WAF Hill and new construction on WAF Hill would be expected to create an improvement in visual conditions in the WAF Hill area.

Ammo Hill, in particular, is a visually prominent land form in the area and any development on its slopes would be noted, particularly from within the project site. It is important to note that the tops (ridgelines) of Ammo and Reservoir Hills would remain in open space (see Figure 2-3, Proposed Land Use Diagram), generally conforming with Novato General Plan Policy NE-7 concerning the development of hills.

Proposed plantings between U.S. 101 and the project site would screen views to the project site's interior, including Ammo Hill, Reservoir Hill and WAF Hill. While the initial plantings would not substantially screen views from U.S. 101, the effectiveness of the plantings to screen views would increase over time as the plantings would mature and increase in size. Additionally, new buildings located closer to U.S. 101 in the foreground would also screen views to the hill forms and other interior portions of the site as noted previously. However, the new foreground buildings would increase the visual presence of site construction along U.S. 101. Because of its size and extent of development proposed, the project at full build-out would give the impression of a community with its own identity reinforcing the awareness of development along the U.S. 101 corridor. This would be particularly true for those who would enter the site from off-site areas that are less intensively developed. The presence of six story buildings in the new development area would reinforce the sense of community identity at Hamilton Field because there are no other six story structures in developed areas surrounding the project site.



HAMILTON FIELD
MASTER PLAN
EIR

FIGURE 3.1.9-14

VIEW OF PROJECT
FROM BEL MARIN KEYS UNIT 4

To the extent visibility of project buildings from U.S. 101 and adjacent lands would be reduced by landscape plantings of trees and shrubs around the project site edge, the sense of project visual exposure and community identity from off-site areas would also be reduced. With increased emphasis in providing landscape plantings around the site that screen views to the site from surrounding areas, the sense of community identity would be perceived more directly from within the site.

It should be noted that noise walls along U.S. 101 and/or Nave Drive are needed to protect Lanham Housing and Meadow Park School from existing and future traffic noise (see Section 3.2.5, Noise). An 8-foot high wall just east of Nave Drive would maintain noise levels at their present values. The wall would therefore be located between Bolling Drive on the south and State Access Road on the north, a distance of 0.6 miles.

While the elevation of Nave Drive varies with respect to the elevation of U.S. 101, in general some views into Hamilton Field from U.S. 101 would be blocked by the sound wall south of State Access Road, particularly from travel lanes in the northbound direction nearest the wall. It would be expected that all views from Nave Drive into Hamilton Field south of State Access Road would be blocked by the sound wall. However, the central development area north of State Access Road, where Christmas Tree Hill would be removed, would be visible from U.S. 101 and Nave Drive as noted previously. Any proposal by CalTrans to construct a 12-foot high noise wall between U.S. 101 and Nave Drive along the school frontage would further obstruct views into the Hamilton Field area from U.S. 101.

On-Site Views

Hamilton Field currently contains a mix of buildings that reflect various architectural styles including Neo-classical, Spanish/Mediterranean, and Federalist as discussed previously. Typically, buildings are painted white and constructed of wood or stucco with traditional clay tile roofs (Figures 3.1.9-2, 3.1.9-3 and 3.1.9-6). In the Hangar Row area, structures are constructed of concrete and glass (Figure 3.1.9-15). The project sponsor has thus far stated in the Hamilton Field Master Plan that the patterns and materials of the existing military buildings in the Old Headquarters area will remain; new development in the area will be consistent with the existing forms.



**HAMILTON FIELD
MASTER PLAN
EIR**

**TYPICAL ARCHITECTURE
IN HANGAR ROW AREA**



FIGURE 3.1.9-15

The Main Gate structure (entry structure over Main Gate Road near Nave Drive) would need to be removed to make way for the project. The project sponsor's findings are that the structure will not allow unobstructed passage of some fire truck vehicles, which limits fire protection access to the Hamilton Elementary School, Capehart Military Housing and southerly portions of Lanham Housing. It has been established that the gate structure offers limited passage to other vehicles as well as moving vans and large trucks. With dedication of Main Gate Road as a public street, demolition of the Main Gate would remove an object familiar to users and occupants of Hamilton Field.

The arrangement of landscape elements on the project site has been defined. Residential development, particularly on the hills, would be screened with plantings of trees and shrubs in an effort to reduce the perceived visual extent and complexity of development. However, in this effort, the existing vegetative character of the hills would be altered (see Section 3.2.3, Vegetation and Wildlife), but would not be inconsistent with the wooded vegetation of hillsides west of the site. Landscape treatment would also be used to strengthen the perceived circulation pattern on the site. Trees planted along major streets would be arranged in a formal linear pattern, and would occur in the Old Headquarters area, the Central area, and Hangar Row. Figure 3.1.9-16 shows the existing formal landscaping which occurs along Palm Drive in the Old Headquarters area. It is noted the Palm Drive is one of the few curving streets on the project site.

It should be noted that construction within the drip lines of existing trees, particularly oak and madrone trees, could jeopardize the health and surviveability of the trees. The loss of existing mature trees on the site would be adverse to existing conditions of the visual setting.

ALTERNATIVE 1: DECREASED HOUSING, INCREASED JOBS

Decreasing the housing while increasing the number of jobs to be held at Hamilton Field would generally increase the intensity of development within the employment generating portion of the project. Decreased housing would allow for constructing fewer units per acre of housing. Overall, impacts for this alternative would not be expected to be appreciably different than for the project as currently proposed.



**HAMILTON FIELD
MASTER PLAN
EIR**

**VIEW LOOKING SOUTHWEST
ALONG PALM DRIVE**

FIGURE 3.1.9-16

ALTERNATIVE 2: DECREASED HOUSING, DECREASED JOBS

Decreasing the level of development on the project site would allow more hillside areas to remain in open space than under the project as proposed. There would be the opportunity to relegate buildings to a maximum 5-story height in the New Development area in lieu of the 6-story structures currently proposed as discussed previously. With the exception of building heights and hillside construction, the general appearance of this alternative would be consistent with the project as proposed.

ALTERNATIVE 3: INCREASED HOUSING, DECREASED JOBS

An additional 200 units of housing over the project as proposed would require additional land for housing development, north of State Access Road. This land would be available for housing because of a reduction of 1,200,000 square feet in job producing space. The project would appear more residential in character than the project as proposed and there would be no 6-story office buildings. The project would appear less urban within the setting than the project as proposed because of the reduction in office space and increase in residential units.

MITIGATION MEASURES

Measures which would mitigate visual impacts of the proposed project are discussed below. Those mitigation measures that have been proposed by the project sponsors are so noted.

Project Site

Land Use Policy No. 5 of the Novato General Plan Urban Environment Element dealing with height limits states:

"With few exceptions, Novato's overall visual image is characterized by lower structures and less intense development. This should continue, with a general three-story, above-ground height limit. Parking decks, penthouses and similar features are to be considered as stories. Greater heights may be allowed due to topographic conditions, such as development on hillsides and in or over floodway swales, or when existing site constraints significantly limit the area of development. Greater heights may also be encouraged where the City wants to meet certain objectives, such as the creation of visual focal points, increased provision of open space, and provision for mixed uses or increased intensity of development. In all projects exceeding three stories, the City will require measures which will reduce or eliminate negative visual impacts such as increased setbacks, utilization of existing and new screening, and creative site and architectural design solutions."

Accordingly, building heights and setbacks should be established for review by the City of Novato Design Review Board and maintained according to the seven distinct spatial zones defined by the project sponsor, as described previously (for additional information regarding issues of density and building height as relates to the Novato General Plan, refer to Section 3.1.1, Planning and Relationship to Plans).

To this end, project site designs should be prepared for each phase of development that specifically details building location and height, as each phase of the project is proposed for development. Building location and height should take into account the provisions of Land Use Policy No. 5 for subsequent visual and planning analysis prior to review and recommendations by the Design Review Board. It may be determined by the City that detailed visual studies be conducted for prominent structures as more precise site and design applications are submitted to the City of Novato.

Building Siting and Design

This analysis addresses the Master Plan concept for development, which by definition is more general than are detailed plans for development in specific areas encompassed by the Master Plan. Therefore, as noted previously, further study is necessary before a final determination of visual impacts relating to specific area building design can be made; more detailed site plans, building elevations, and design standards should be provided by the project sponsor for review by the Novato Design Review Board prior to approvals of specific portions of the project.

Design standards should be established for all buildings which are rehabilitated, replaced, or which infill the site in all spatial zones for review and approval by the Novato Design Review Board. The standards should include guidelines for height and bulk, form, detailing, materials and color for further study prior to the approval of precise development plans. While it is recognized that an objective of the project sponsor is to design and construct buildings "in response to the function of the structure," a more precise statement regarding project building architecture and site design has been made by the project sponsor to guide overall project development and to clarify the project's visual image as discussed further below.

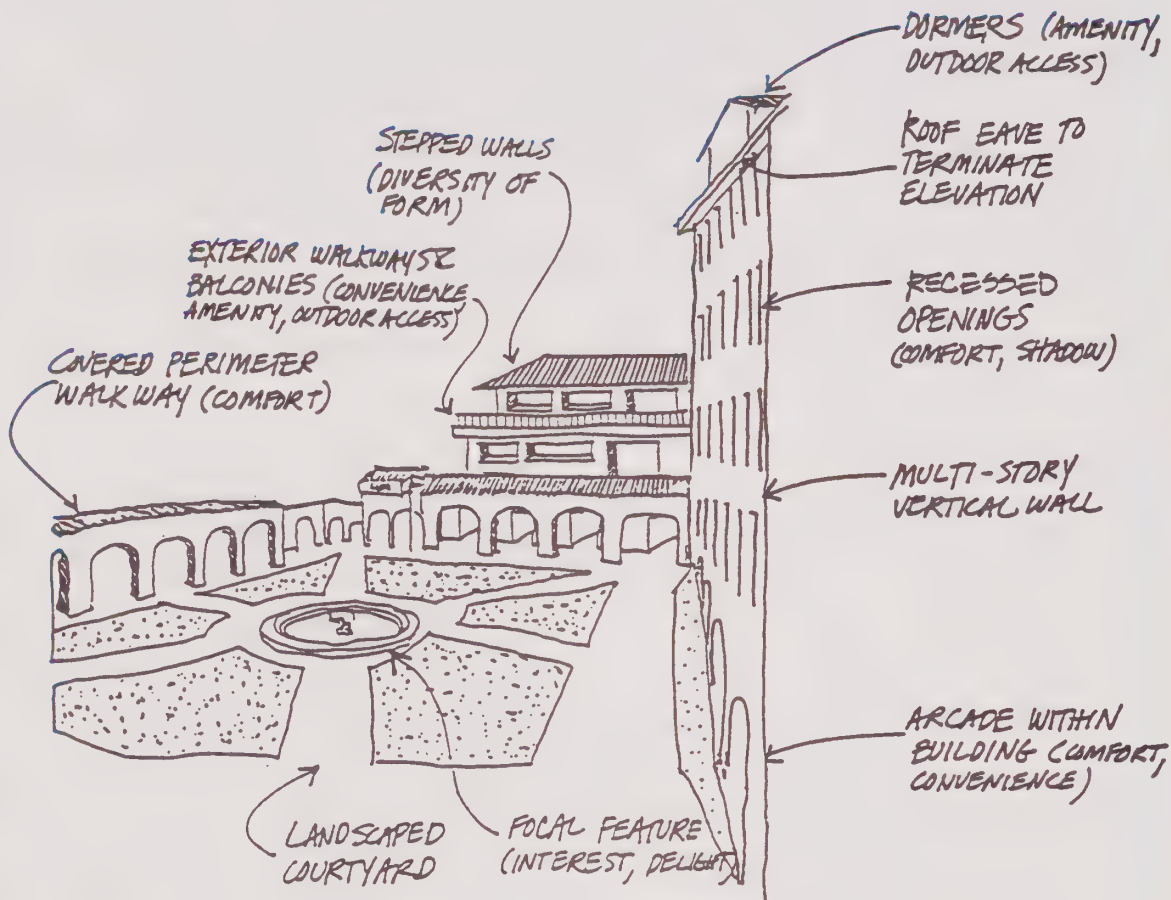
The following general guidelines for site development are as developed by the project sponsor. It must be recognized that the guidelines are general in nature, but do indicate an overall design intent for site development. The EIR discussion following these guidelines is generally meant to reinforce a number of visual mitigation measures contained in the guidelines. Examples of the planning principles and architecture discussed in the guidelines and as prepared by the project sponsor are shown in Figures 3.1.9-17, 3.1.9-18 and 3.1.9-19.

GENERAL GUIDELINES

Building Form

"The predominant building style in the Old Headquarters and Hangar Row areas in all new areas (office, residential, etc.) will follow the Mediterranean/Spanish style present on the base. The style is a unique combination of a sophisticated European architectural style modified by native culture, local climate, and traditional building methods. The result of this process is an architecture grounded in a formal and studied organization, yet simple and direct in its execution. The style is characterized by stucco walls, light colored paint surfaces, sloping tile roofs, and features such as espanadas. The buildings, which can be large, achieve a human scale by the understandable sizes of doors, windows, and arcades. Scale relationships are apparent also by the sequence of the structures for they frequently use garden walls, trellis structures, covered passageways, and one and two-story buildings as parts of a much larger building, thus achieving a sequence in size from garden level to a large building mass.

"Surface detail and ornament add to the visual interest and an understanding of building size. Ornamentation is sparse and localized at openings, cornices, and accent points of the architectural composition. Buildings are often organized formally with predictable and orderly site relationships. The buildings, in combination with walls and arcades, create and surround courtyards which provide privacy, climate control, separation from urban noises, and opportunity for focal elements such as fountains or other garden features. Sun control is achieved and shadow created by recessed windows, roof overhangs, and trellis and arcade structures.

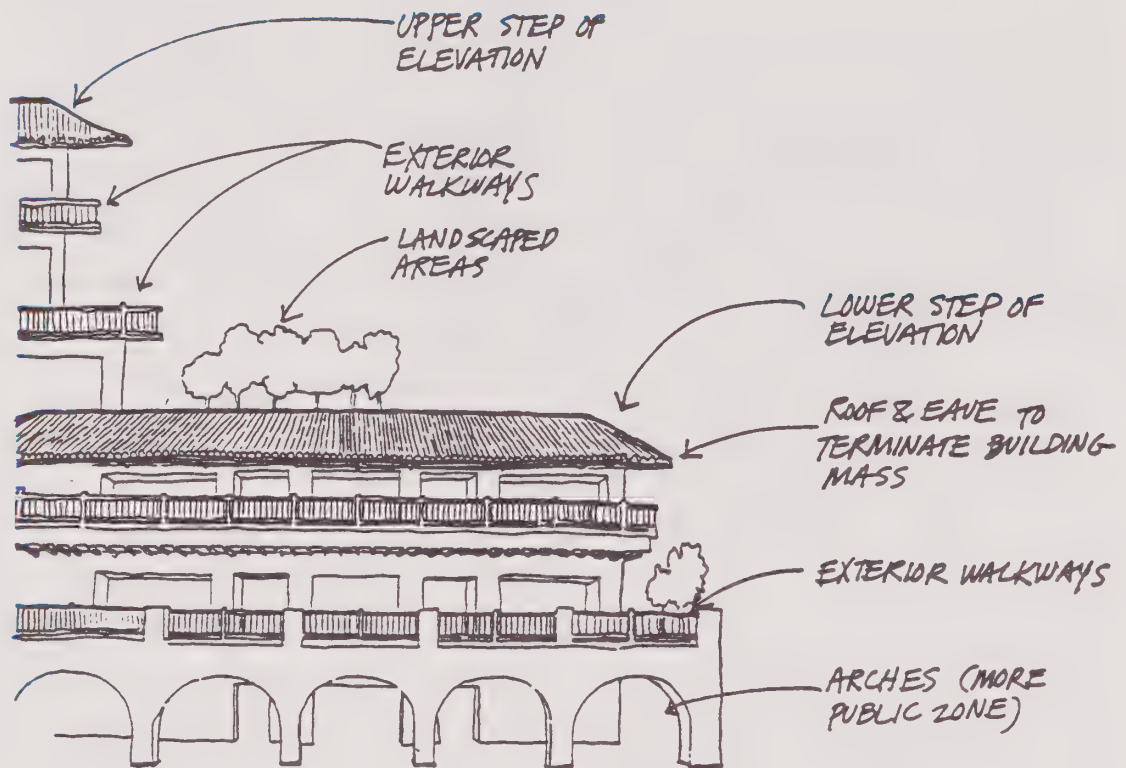


HAMILTON FIELD MASTER PLAN EIR

DESIGN PRINCIPLES BUILDING RELATIONSHIPS



FIGURE 3.1.9-17

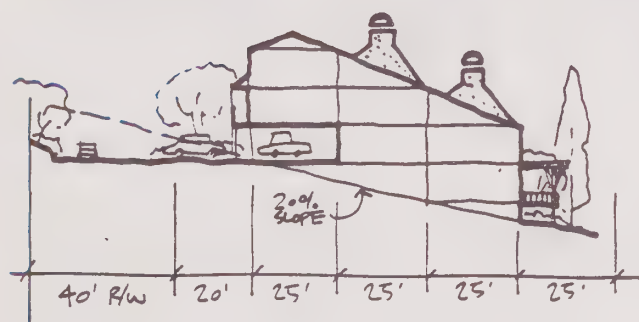
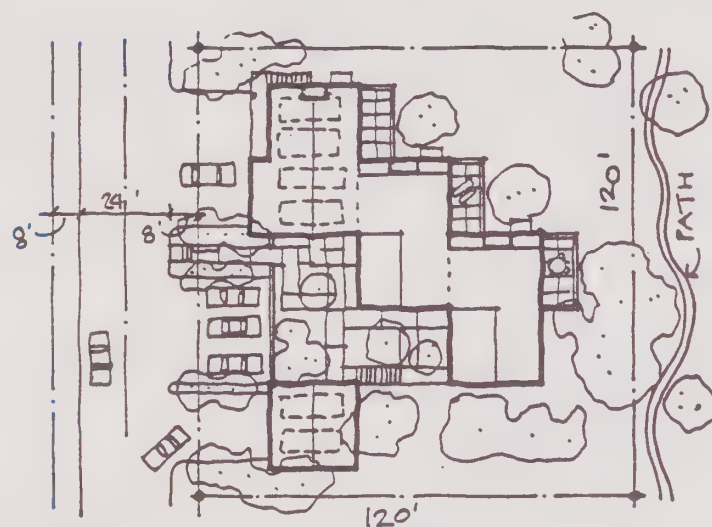


HAMILTON FIELD MASTER PLAN EIR

DESIGN PRINCIPLES MULTI-STORY OFFICE BUILDING



FIGURE 3.1.9-18



1000 SQ. FT. 2 BDRM
FLATS @ FOOTHILLS

.120' x 120'	14,400 SF
.20' x 120'	2,400 SF
TOTAL AREA	16,800 SF
GROSS AREA	0.38 ACRES
DENSITY	15.0 DU/AC
PARKING	15/1 RATIO
COVERAGE	21.5%

MULTIFAMILY/
FLATS UP TO 1000 SF
2 BDRM

HAMILTON FIELD MASTER PLAN EIR

DESIGN PRINCIPLES MULTI-FAMILY FLATS



"The integration of buildings with the landscape is a strong characteristic of the style. The sense of indoor/outdoor relationship can be achieved by the integration of floor surfaces, by the extension of walls and trellis structures from buildings outward into gardens, and by the use of smaller scale interior gardens within buildings."

Building Height and Bulk

"The Master Plan includes a diagram which shows zones of building height for the project. Office buildings may vary in height from one to six stories with the six story height zone central to the new development area. Residential buildings may vary in height from one to three stories, however, one level of parking will be permitted under three residential stories in flatland areas. These heights were established following a visual analysis of the site. The height controls as assigned are intended to prevent undue visual impact on the adjacent public.

"Use of the Mediterranean style as the predominant architectural theme provides excellent control over building height and bulk. Inherent in the style, as previously described, are approaches to massing and detail which ensure human scale buildings. Taller buildings will be seen as a part of a 'family' of similar structures, not as individual vertical buildings. The height and bulk of major buildings will be relieved by stepping of structures both in vertical and horizontal planes. Predominant use of sloped roofs will achieve site unity and appear to lower buildings by creating horizontal rather than vertical rooftop forms. Surface texture, windows with depth to create shadow, lower scale elements such as walls and arcades, all will contribute to recognizable scale and modification of the bulk of structures. The integration of buildings with the landscape and the organization of courtyards will further achieve a reduction in the impact of any single building as having undesirable height or bulk. The project appearance is to be that of a community, not an assemblage of individual structures."

Site Form

"The buildings are to be organized to create a progression of spaces with frequent visual focal features so that one has a sense of location on the site. Outdoor spaces are to be sized appropriate to their usage and activity but with a diversity of scale for visual interest.

"Building relationships to streets are to be controlled by setbacks. Although most required setbacks are a constant dimension, the project will use varying setbacks to create diverse settings. For example, a building arcade may intrude into a setback to achieve a close building relationship for a transit stop, thus gaining climate protection and improved safety for transit users. The organization of the landscape is to aid in the identification of places and to make understandable the various circulation routes. Plants are to shade paved surfaces, modify wind to create usable spaces, and prevent surface erosion. The landscape is to unify the entire development."

In addition, there are a number of design principles that should be taken into consideration in project building siting and design, reinforcing an overall design concept for the project. Examples include:

- o Achieve visual unity among office buildings, residential structures, commercial buildings and other buildings on the site.
- o Relate the scale of new development (building height and bulk) to the predominant scale of development on adjacent parcels.
- o Vary the height and bulk of major buildings for visual interest and to achieve a compatibility in scale between taller structures and lower adjacent structures by stepping structures in both vertical and horizontal planes.
- o Use sloping roof surfaces to reduce the apparent height of structures and relate structures to the human scale of movement and space perception.
- o Combine buildings in such a way as to achieve a family of structures in lieu of individual vertical elements.
- o Construct lower buildings around taller buildings toward the site's interior to maintain a transition in building scale relationships between the outer edges of developed areas (and Lanham housing) and the site's interior spaces. (Project sponsor recommendation.)
- o Organize buildings to create a progression of spaces with frequent visual focal features to achieve a sense of location on the project site.
- o Site buildings on flat portions of the site in orderly configurations around courtyards and open space, consistent with the historic pattern of development on the site.
- o Provide varying setbacks from streets to provide variety and diversity within individual settings.

The project sponsor has also established the following mitigation measures regarding site design and appearance:

"The project CC&Rs and all sale and land lease agreements for Hamilton Field will include the requirement that all building designs will be submitted to a Hamilton Field Property Owners Association architectural review committee to ensure consistency with the design principles of the Hamilton Field Master Plan."

"An enhanced landscape treatment along State Access Road right-of-way for the length of the Lanham Housing Project will be incorporated to further screen Lanham Housing from commercial development. The enhanced treatment will include, if feasible, berming and additional plantings for screening."

"At the submittal of Phase I precise plans, project signing standards for all project signing will be established. The signing standards will restrict signing type, size, lighting materials and locations."

Site and Landscape Design

Traditionally, the integration of buildings with the landscape is a strong characteristic of the Spanish/Mediterranean architectural style. However, landscape character should relate to the needs of those who would use the site on a daily basis as well as those who would pass through or adjacent to the site on existing and future roadways. In this context must also be considered the projection of an acceptable community image within the framework of the total community landscape. To this end, the following mitigating criteria relative to the formation of landscape character are identified:

- o Provide the opportunity for project residents and employees to have visual and physical contact with the environment external to building systems.
- o Construct an open space network that contacts all building masses for visual and physical accessibility to the external environment (project sponsor recommendation). Construct the open space network to provide a physical setting for the establishment of architectural forms.
- o Allow for pedestrians to have the option of moving from point to point through exterior open spaces as an alternative to circulating through climate controlled spaces.

- o Design site landscape systems to express the unification of the open air and man-made elements of the site. "The sense of indoor/outdoor relationship can be achieved by the integration of floor surfaces, by the extension of walls and trellis structures from buildings outward into gardens, and by the use of smaller scale interior gardens within buildings." (Project sponsor recommendation.)
- o Utilize landscape plants in such a way as to achieve a transition in scale between project buildings, and between interior and exterior environments.
- o Design site landscape systems to achieve spaces which appear to expand in size rather than contract or restrict movement and visibility.

To be visually compatible with the community, the idea of establishing a park-like setting for the proposed project should be considered as an objective by the project sponsor. In this context, landscape elements of trees, shrubs and ground form should suggest a strong visual definition of pedestrian and vehicle circulation, provide sightline control and improve the appearance of large parking areas. While landscaping with vegetation is the most effective means of mitigating a variety of visual impacts, it must be remembered that plants take time to grow; their effectiveness as visual screens is limited at the beginning and increases only with time.

A visual buffer system is proposed to be established between Nave Drive and the project site. This would occur north of State Access Road to the extent a noise wall on the east side of Nave Drive would be required south of State Access Road. Its purpose would not be to separate the project site from the community or obstruct views to the site's interior, but rather to reduce or soften the visual impact of site development on the view from Highway 101, Alameda del Prado and Nave Drive. The buffer would also be structured to frame and invite views into the project as well as allow for establishing a project visual identity. The buffer may be comprised of linear overhead tree massings forming a three-dimensional edge to the project which would assist the site visitor in understanding his location with respect to the general area. The buffer may be enriched with understory plantings consisting of shrubs and ground covers that afford a variety of seasonal interest by including spring flowers, summer fruit, fall color and winter bark and berries.

State Access Road and proposed entry north of State Access Road would be similarly treated to screen and control project views and define the primary entrances to the

project site. It is the project sponsor's objective to achieve a combination of landscaping and building form to create a sense of arrival at the new north entry and State Access Road, within the overall context that the Nave Drive corridor is important to Hamilton Field for its identity.

Additionally, the stand of mature trees bordering Lanham Village along State Access Road should be retained for the visual amenity they provide, roadway screening characteristics and contrast to the constructed environment. Existing grassland and oak/madrone trees should be retained on the project site's hills, and to the extent possible consistent with the need for hillside grading, on hillside slopes for the visual amenity these trees currently provide. The placement of homes in any hillside areas should be done on a site-by-site basis to ensure that a minimum of existing trees are removed. Plans should be submitted to the Novato Design Review Board for review and approval prior to City approval of the various project phases.

Parking areas should be planted extensively with appropriate ornamental vegetation which would provide shade and visual relief from paved surfaces. In addition to the trees proposed for use in parking areas, understory plantings of the buffer noted above should extend to and screen surface parking areas on contoured earth forms, thus reducing the visual impact of large areas of parked cars from eye-level vantage points both on and off the site.

Any plans for the installation of walls to mitigate noise impacts (see Section 3.2.5, Noise), should occur in conjunction with the overall site planning and landscape development process to avoid the separation or isolation of land use areas where such separation or isolation would be adverse to the land use, to ensure that adequate roadway and building setbacks are maintained from local roadways, and to reduce the visual presence of noise walls. These design and planning considerations would need to be considered as part of the overall plan for development, detailed on a development plan and implemented on a site-specific basis.

ALTERNATIVE 1: DECREASED HOUSING, INCREASED JOBS

ALTERNATIVE 2: DECREASED HOUSING, DECREASED JOBS

ALTERNATIVE 3: INCREASED HOUSING, DECREASED JOBS

Mitigation as described above for the proposed project would apply equally to the three alternatives. Each of the alternatives would generally use about as much land as the proposed project. With reduced development intensity, there would be provided the opportunity to incorporate more open space into the project for project occupant and public use.

SUMMARY COMPARISON OF IMPACTS AND MITIGATION MEASURES

3.1.9 VISUAL QUALITY

	IMPACT	MITIGATION
PROPOSED PROJECT	New foreground buildings would increase the visual presence of development to be seen along U.S. 101. Because of the size and extent of development proposed, the project at full build-out would give the impression of a community with its own identity reinforcing the awareness of development along the U.S. 101 corridor.	Plantings for visual screening are proposed along the U.S. 101 frontage. The project would be designed using a Spanish / Mediterranean architectural theme consistent with the existing architecture.
ALTERNATIVE 1: (Decreased Housing, Increased Jobs)	Alternative 1 would not be expected to be appreciably different than the project as proposed.	Mitigation for the project as proposed would apply equally to the three alternatives.
ALTERNATIVE 2: (Decreased Housing, Decreased Jobs)	The appearance of Alternative 2 would be generally the same as that of the proposed project. With decreased development, buildings could be a maximum of five floors instead of six, and more hillside areas could remain in open space.	Mitigation for the project as proposed would apply equally to the three alternatives. With reduced development intensity, there would be increased opportunities to incorporate more open space into the project for occupant and public use.
ALTERNATIVE 3: (Increased Housing, Decreased Jobs)	Alternative 3 would appear more residential in character than the project as proposed. Alternative 3 would appear less urban and there would be no six story office buildings.	Mitigation for the project as proposed would apply equally to the three alternatives. With reduced development intensity, there would be increased opportunities to incorporate more open space into the project for occupant and public use.

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3.1.10 CULTURAL RESOURCES

SETTING

Area Occupation

At the time of European contact, Marin County and the southern portions of Sonoma County were occupied by the Coast Miwok. This group was one of seven Miwok dialect groups. Each tribelet maintained at least one year-round principal village with permanent structures and residents. Along the bay shore, major villages were situated adjacent to estuaries with seasonal villages located in the surrounding hills. Living quarters were small, conical, grass-thatched lodges constructed on a framework of bent poles.

The seasonal villages were used during the seasonal rounds of hunting and gathering. The diversified environments in Marin and Sonoma Counties and resources available provided a varied subsistence base for the hunting and gathering peoples of the area.

With the arrival of Europeans in the Bay Area, the Coast Miwok life style rapidly disintegrated and the population became dislocated. In 1776, Mission Dolores was founded in San Francisco and the occupation of native populations by the mission system began. Eventually, the Indians had become dependent on the missions for a livelihood and with secularization, little of their native culture remained. With the arrival of the American period in 1846, the few remaining Coast Miwok found work in the lumbering, dairying and agricultural industries which became prevalent in Marin County.

Evidence of prehistoric and ethnographic tools and features which were used in the procurement and processing of varied food resources by early inhabitants are found in the cultural deposits associated with habitation sites. In the early 1900s, archaeologists and anthropologists became concerned about the future of the rapidly disappearing shellmounds located around San Francisco Bay. In Marin County, soils from many prehistoric sites were being used as fill material and road base. As more sites were investigated throughout Central California in general, it became evident that there was a time depth and cultural change in the archaeological record dating back to 3000 B.C. Research shows that the greater Hamilton Field area was occupied by native populations during prehistoric times and numerous archaeological sites are recorded in the area. Five sites have been selected as representative of the work done in the project area:

1. CA-Mrn-158 is located about 0.5 miles from the project site. Three burials and artifacts were removed from the midden.
2. CA-Mrn-168, which is located in Ignacio about 0.4 miles west of the project site, was excavated and at least eight burials and numerous artifacts were recorded.
3. CA-Mrn-7, located at the upper end of the Arroyo San Jose drainage, about 2.5 miles northwest of the project site, also contained a number of artifacts but no human remains.
4. CA-Mrn-152 is located in Pacheco Valley, about 1.25 miles southwest of the project site. Excavations of the site produced drills, bifaces, scrapers, projectile points, mortars and bone awls.
5. CA-Mrn-170 is located in Ignacio, about 0.5 miles north of the project site. Artifacts from CA-Mrn-170 indicate that this shellmound was occupied up to the early nineteenth century.

The information available from these past excavations in the Hamilton Field area lead to the conclusion that the local environment was an important prehistoric habitation and utilization locale. The archaeological evidence suggests that the region was occupied as early as 3625 B.C. and was likely continuously occupied by indigenous populations up until as late as the post-mission era in the mid-1800s.

Hamilton Field¹

According to records maintained at the California Archaeological Inventory at Sonoma State University, three archaeological sites are located within the Hamilton Field military reserve boundaries, CA-Mrn-149, -160 and -161. In 1976, archaeological survey work was conducted for areas proposed for ownership change at Hamilton Field.² The objectives were to relocate previously identified sites and to locate any previously unrecorded resources within specific parcel boundaries. The surveys resulted in the identification of two possible locations of CA-Mrn-149 (one of which was a reported location of a plaque-bearing boulder), and the identification of an unrecorded site area identified as "Site C". It was also reported that CA-Mrn-160 could not be located and was likely situated outside

the study parcel boundaries. Further, it was reported that no archaeological deposits at the recorded location of CA-Mrn-161 were found and it was suggested that the location of "Site C" was the actual location of CA-Mrn-161.

It was later concluded that the Site C location be subjected to archaeological testing and significance determination in the event that the area would potentially be subject to disturbance. It was also recommended that even though no archaeological remains appear to exist at the recorded CA-Mrn-161 location, some protective measures would be appropriate for that site.

In 1980, the reported location of Site C was the subject of another subsurface investigation.³ The work consisted of an auger boring program and the excavation of a single, one meter square test unit. The investigation produced no evidence of any intact cultural deposits.

Historical

Construction at Hamilton Field began in 1931 under the engineering supervision of Captain Howard B. Nurse. In keeping with traditional California-Spanish architecture style, Nurse envisioned a base of white stucco buildings with red tiled roofs, a base which would be of high esthetic value and efficiently operated by the Army Air Corps. On May 12, 1935, formal dedication ceremonies were held at Hamilton Field, named posthumously after Lt. Lloyd A. Hamilton, a flier killed during World War I. Today, the stucco buildings with red tiled roofs may be found in a clustered grouping west of the hangars, referred to as the Old Headquarters Area.

For additional information regarding the history of Hamilton Field, refer the Appendix, History of Hamilton Field.

IMPACTS

PROPOSED PROJECT

Archaeological

Since the 1976 field reconnaissance noted above, no intensive survey work had been accomplished within the project boundaries. While the 1976 field investigations appear to

have been thorough, it was determined that a follow-up field review of the area would be appropriate for the Hamilton Field Master Plan project. Within a decade, field conditions and land form configurations can change, potentially exposing any previously undetected archaeological deposits. The survey can be described as a "General Surface Reconnaissance" in which the more open, accessible terrain is examined for the presence of cultural deposits and features.^{4,5}

During the field review, close attention was given to the detection of those surface features which could suggest the presence of prehistoric archaeological resources such as changes in soil color, composition of the soil and/or texture which could suggest the occurrence of an archaeological midden, unusual ground contours, abrupt changes in vegetation patterns, the presence of prehistoric artifacts, obsidian or other types of flaking wastes, fire-fractured rock, charcoal deposits and/or charred faunal remains. Particular efforts in this regard were concentrated in the general areas surrounding the reported locations of CA-Mrn-160, -161 and Site C.

No evidence of archaeological deposits was observed at the reported location of CA-Mrn-160. However, the dense vegetation in that area could be obscuring surface evidence. The mapped location of the site is given as outside, but immediately adjacent to the Hamilton Field project boundary. Consequently, while it is likely that the site is located outside the project area, the status of CA-Mrn-160 remains uncertain.

No evidence of archaeological deposits was detected at the reported location of CA-Mrn-161. It was observed that the mapped location of the site consisted of a hillside terrace, which was found to be greatly disturbed due to the past construction of military facilities and a railroad grade. It is concluded that if a site was situated at that location, it was destroyed by past land alteration activities.

Regarding Site C, it was determined that because of the uncertain boundaries of the area which was previously investigated, it would be appropriate to supplement the previous studies with auger borings. Twenty-one borings using a four inch diameter barrel auger were excavated at Site C. Most of the borings were taken to depths of about 80 to 120 centimeters and all soils were passed through a 1/8-inch mesh screen. With the exception of a few shell flakes observed in strata near the ground surface in two borings, no

evidence of archaeological deposits was encountered. It was concluded that there are two possible explanations for Site C.

1. The minute traces of shell in the area had been redeposited from another site, through the importation of topsoil for gardening. The presence of water pipes indicated that a garden had been planted in the area. The very small size of the shell in the topsoil indicates that the soil may have been tilled to such an extent that the shell became finely ground.
2. There was a prehistoric site at the location of Site C which had been thoroughly destroyed. The construction of the fire roads, trench and nearby parking lot indicates that the site, if there ever was one, may have been destroyed and removed or mixed with topsoil.

The two potential locations of CA-Mrn-149 are situated outside the current project boundaries and are not regarded as potentially affected resources.

During the field survey, shell-laden, midden-like soil was observed at five additional locations within the project area. These locations were situated adjacent to abandoned military buildings in what appeared to have been lawn or garden locations. Two auger borings at each location revealed a uniform mix of the midden-like soil with the native topsoil to a depth of 20 centimeters, underlain with a sandy loam. No evidence of a primary cultural deposit was encountered at any of the five locations and it was concluded that the midden-like soils were imported and mixed with the existing soil for the purpose of enriching lawn and garden areas. There is no way of knowing where the soils came from. However, it is possible that the soils were removed from one of the destroyed archaeological sites. Whatever the situation, no further archaeological consideration at these locations is required.

In summary, the proposed Hamilton Field Master Plan project would have no direct or long-term adverse impacts on any cultural resources which are presently defined as archaeologically or historically important. The criteria for measuring such significance, by both federal and State standards, is whether or not a resource is eligible for nomination to the National Register of Historic Places. No archaeological sites or potential site locations were encountered which would possess the depositional integrity, research potential or Native American sensitivity to be considered for nomination.

Historical

During the field review of the project area, efforts were made to detect the presence of potentially significant historic sites, features and structures. With the exception of the white stucco, tile roofed buildings of the Old Headquarters Area and Main Gate which date from the original Hamilton Field construction period, no such sites or features were observed. Past cultural resources evaluations of Hamilton Field have suggested that these buildings are of community importance, but not necessarily of great historical significance. The fact that the buildings were constructed about 50 years ago puts them within the time frame for consideration as historically significant structures. Based on existing historical documentation, it would appear that these buildings have not been evaluated for significance by a qualified architectural historian, in accordance with National Register of Historic Places eligibility criteria. Thus the historical significance of the structures has never been determined. It is possible that elements of project rehabilitation and development could result in the architectural and/or structural modification of the buildings, potentially affecting the status of their eligibility for nomination. The Main Gate would be removed to allow for the passage of trucks, fire trucks, buses and to provide for roadway and project construction.

ALTERNATIVE 1: DECREASED HOUSING, INCREASED JOBS
 ALTERNATIVE 2: DECREASED HOUSING, DECREASED JOBS
 ALTERNATIVE 3: INCREASED HOUSING, DECREASED JOBS

Archaeological

The land area for the Proposed Project would be the same as for Alternative 1, 2 or 3. Thus, as for the Proposed Project, the buildout of Alternative 1, 2 or 3 would have no direct or long-term adverse impacts on any cultural resources defined as archaeologically or historically important.

Historical

As for the Proposed Project, under Alternatives 1, 2 or 3, it is possible that rehabilitation of structures in the Old Headquarters Area could result in the architectural and/or structural modification of the buildings, potentially affecting the status of their eligibility for nomination to the National Register of Historic Places.

MITIGATION MEASURES

PROPOSED PROJECT

Archaeological

Despite the field observations which suggest that CA-Mrn-160 is likely situated outside the project area boundaries, the archaeological sensitivity of the general location of CA-Mrn-160 remains uncertain. It is therefore recommended that prior to any land alteration in the immediate area, a follow-up survey of the terrain take place. The inspection should be accomplished at a time of year when the vegetation is sparse, or has been removed, so that thorough ground inspection is possible. Should evidence of CA-Mrn-160 be detected within the project area, then measures should be taken to determine the extent and nature of the deposits and the significance of the resource. Decisions can then be made on whether to protect the find, or perform partial or full retrieval. All such procedures should be conducted by a qualified archaeologist in full consultation with the local Native American community and in compliance with appropriate State and Federal requirements.

Field observations strongly suggest that no archaeological deposits exist at CA-Mrn-161 or Site C. However, if a resource did exist at one time at either site, it is possible that subsurface remnants could be present in the immediate vicinity. It is therefore recommended that if land alteration activities are scheduled for the location of CA-Mrn-161 or Site C, the construction should be monitored by a qualified archaeologist and Native American consultant. Should buried archaeological deposits be encountered at that time, work should cease in the vicinity of the find so that measures can be taken to determine the extent and nature of the deposits and significance of the resource.

The fact that no additional ground surface evidence of archaeological deposits was observed within the project area does not preclude the possibility that archaeological remains exist below the ground surface within the project area and could be encountered during subsurface construction activities. In the event that archaeological remains are encountered during construction, it is recommended that construction be halted in the area of the find and action taken as recommended above for sites CA-Mrn-160, 161 and Site C.

Should Native American burial remains and associated cultural materials be encountered during subsurface excavations, adherence to the provisions of California Senate Bill 297 should be strictly observed. This includes contacting the County Coroner, the Native American Heritage Commission and American Indian Council of Marin. Under no circumstances should construction personnel or others disturb or remove any burial materials or artifacts; only a qualified archaeologist who has consulted with the above parties should deal with the remains. The implementation of a specific management program developed between the project sponsor, the American Indian Council of Marin and the consulting archaeologist would be required prior to proceeding with construction in the area of the find. Such a program should include explicit language regarding the disposition of burial materials and artifacts.

Historical

Prior to reconstruction and rehabilitation in the Old Headquarters Area, it is recommended that an architectural historian evaluate the significance of the white stucco, tile-roofed buildings within the Old Headquarters Area. At that time, if a finding of significance is established, the implications of project construction and building rehabilitation on the historical significance of the buildings can be determined. If the impacts are determined to be adverse, the preservation of significant buildings, structures and their architectural features would be an acceptable form of mitigation as determined by the architectural historian.

Additional Mitigation Measures Proposed by the Project Sponsor

The following mitigation measures are proposed for implementation by the project sponsor:

- o The bronze plaque commemorating the dedication of Hamilton Field, located on the front of the flag standard at 500 Palm Drive, would either be preserved in place or relocated within the Headquarters Area. The 500 Palm Drive headquarters building is planned for rehabilitation.
- o The Freedom Tree bronze plaque dedicated to all military personnel that were prisoners of war or missing in action will either be preserved in place or moved to a nearby location within the Headquarters Area. A Freedom Tree will be planted to replace the original tree which was removed from the plaque site.
- o The project sponsor proposes to identify a location for a historical museum commemorating the former use of Hamilton Field as an Air Force base. The location

of the museum will be identified prior to, or during, the submittal of the Phase III precise plan.

ALTERNATIVE 1: DECREASED HOUSING, INCREASED JOBS

ALTERNATIVE 2: DECREASED HOUSING, DECREASED JOBS

ALTERNATIVE 3: INCREASED HOUSING, DECREASED JOBS

Archaeological

The mitigation of potential impacts to archaeological resources would apply equally to the Proposed Project and Alternatives 1, 2 and 3.

Historical

Mitigation relating to the rehabilitation and reconstruction of existing white stucco, tile-roofed building of the Old Headquarters Area would apply equally to the Proposed Project and Alternatives 1, 2 and 3. The project sponsor proposed mitigation measures would also apply to Alternatives 1, 2 and 3.

¹ Cultural resources investigations for the proposed project were initiated by reviewing maps, files and records, which indicate the location and nature of known and recorded cultural resources in the general Hamilton Field area. A similar literature review was accomplished at the California Archaeological Inventory, Northwest Information Center at Sonoma State University. In addition, the National Register of Historic Places and the California Inventory of Historic Resources were consulted. Cultural resources personnel at various agencies were contacted regarding the management of known and potential resources within the project area. Further, the American Indian Council of Marin, in San Rafael, and the Native American Heritage Commission in Sacramento were consulted.

² Archaeological Consulting and Research Services, Inc., Report of the Preliminary Archaeological Reconnaissance of AFRES Parcels 1 and 3, Hamilton Air Force Base California; (no date). Report submitted (approximately 1976) to the General Services Administration.

³ Baker, Suzanne and Salzman, Sally, Archaeological Investigations at Site C, Hamilton Air Force Base, Marin County, California, 1980. Report on file at the Heritage Conservation and Recreation Service Interagency Archaeological Services, San Francisco.

⁴King, Thomas F., Moratto, Michael J., and Leonard III, N. N., Recommended Procedures for Archaeological Impact Evaluation, 1973. Published Jointly by the Society of California Archaeology and University of California, Los Angeles.

⁵Prior to initiating the field investigations, Ms. Coyote Flower of the American Indian Council of Marin in San Rafael was contacted. On Ms. Flower's advice, Native American observer Grant Smith was contacted in Santa Rosa, who met with the archaeological study team at Hamilton Field. Also in attendance was R. Paige Talley from the Native American Heritage Commission in Sacramento. At that time the cultural resources background for Hamilton Field was discussed as well as the proposed field procedures for re-surveying portions of the project site and conducting the subsurface archaeological investigations of Site C. It was agreed that Mr. Smith would provide field monitoring services during the investigation of Site C. The City of Novato Planning Department was also consulted regarding compliance with the Novato Cultural Resources Protection Ordinance.

SUMMARY COMPARISON OF IMPACTS AND MITIGATION MEASURES

3.1.10 CULTURAL RESOURCES

	ARCHAEOLOGICAL		HISTORICAL	
	IMPACT	MITIGATION	IMPACT	MITIGATION
PROPOSED PROJECT	There would be no direct long-term adverse impacts on any cultural resources which are presently defined as archaeologically or historically important.	If the land is to be altered, provide a follow-up survey of CA-Mrn-160, and provide mitigation as deemed appropriate. If land is to be altered at CA-Mrn-160, or Site "C", monitor construction by a qualified archaeologist.	It is possible that rehabilitation of structures in the Old Headquarters Area could affect the status of their eligibility for nomination to the National Register of Historic Places.	Evaluate the significance of white stucco, tile roofed structures by a qualified architectural historian.
ALTERNATIVE 1: (Decreased Housing, Increased Jobs)	There would be no direct long-term adverse impacts on any cultural resources which are presently defined as archaeologically or historically important.	If the land is to be altered, provide a follow-up survey of CA-Mrn-160, and provide mitigation as deemed appropriate. If land is to be altered at CA-Mrn-160, or Site "C", monitor construction by a qualified archaeologist.	It is possible that rehabilitation of structures in the Old Headquarters Area could affect the status of their eligibility for nomination to the National Register of Historic Places.	Evaluate the significance of white stucco, tile roofed structures by a qualified architectural historian.
ALTERNATIVE 2: (Decreased Housing, Decreased Jobs)	There would be no direct long-term adverse impacts on any cultural resources which are presently defined as archaeologically or historically important.	If the land is to be altered, provide a follow-up survey of CA-Mrn-160, and provide mitigation as deemed appropriate. If land is to be altered at CA-Mrn-160, or Site "C", monitor construction by a qualified archaeologist.	It is possible that rehabilitation of structures in the Old Headquarters Area could affect the status of their eligibility for nomination to the National Register of Historic Places.	Evaluate the significance of white stucco, tile roofed structures by a qualified architectural historian.
ALTERNATIVE 3: (Increased Housing, Decreased Jobs)	There would be no direct long-term adverse impacts on any cultural resources which are presently defined as archaeologically or historically important.	If the land is to be altered, provide a follow-up survey of CA-Mrn-160, and provide mitigation as deemed appropriate. If land is to be altered at CA-Mrn-160, or Site "C", monitor construction by a qualified archaeologist.	It is possible that rehabilitation of structures in the Old Headquarters Area could affect the status of their eligibility for nomination to the National Register of Historic Places.	Evaluate the significance of white stucco, tile roofed structures by a qualified architectural historian.

3.2 PHYSICAL/BIOLOGICAL

3.2.1 SOILS, GEOLOGY, AND SEISMICITY

SETTING

Topography

Hamilton Field contains within its boundaries a topographical relief ranging from mean sea level (msl) to +164 feet msl. The site generally is flat, but contains four prominent hills: Ammo Hill in the northern part of the site, Reservoir Hill and the Dormitory Housing area in the center of the site, and Christmas Tree Hill along the eastern boundary of the site. Ammo Hill is the highest point on the site.

About 87% of the site has slopes ranging from 0%-15%. About 8% of the site contains slopes from 16% to 30%, and about 5% of the site has slopes in excess of 30% (Figure 3.2.1-1). The steepest slopes are on the east side of Ammo Hill where rock previously was quarried for construction materials.

The site is located in the transition zone between the hilly uplands of Novato to the west and the San Pablo Bay marshes to the east. Portions of the eastern edge of the site were historically part of San Pablo Bay, according to a map prepared by U.S. Coast Survey in 1854. Other portions of the site were part of the flood plain of Pacheco Creek, traversing the site. With the construction of Hamilton Air Force Base in the 1930's, extensive fill was placed on the site; Pacheco Creek was channelized and realigned.

The historical conditions of the site and man-made topographic changes are important considerations when designing foundations for new structures and for identifying potential geologic and seismic hazards.

Soils and Geology

The project site is underlain by two distinctly different types of geologic material: consolidated (bedrock), and unconsolidated (alluvium, colluvium, and Bay mud). The site also contains man-made fills (Figure 3.2.1-2).

The consolidated bedrock under Hamilton Field is marine sandstone of late Cretaceous age (about 80 million years old). It consists mainly of relatively coarse, angular to subangular sand grains of quartz and feldspar, with little fine-grained matrix between the

sand grains. The weathered parts of the sandstone are well-fractured and of moderate hardness. The sandstone forms the hills in the area.¹

The weathering process produces soils from the sandstone that are either sandy or silty and that are well-drained. Because the slopes on the sandstone hills are generally steep, the soils rarely remain in-place, but are washed down-slope by erosion. Erosion is intensified if the vegetative cover is absent or removed. The sandstone slopes historically are not prone to landsliding under natural conditions.² During site reconnaissance in July 1986, some sloughing was evident on Ammo Hill, but no evidence of current or historical landsliding was observed.

Along the bases of Ammo and Reservoir hills is colluvium, an unconsolidated and unsorted soil containing weathered rock fragments that have been washed down from the sandstone hills.¹ The unconsolidated nature of colluvium makes it weak and, unless mitigated, potentially subject to landsliding, particularly on steeper slopes, when the slopes are graded or cleared of vegetation.²

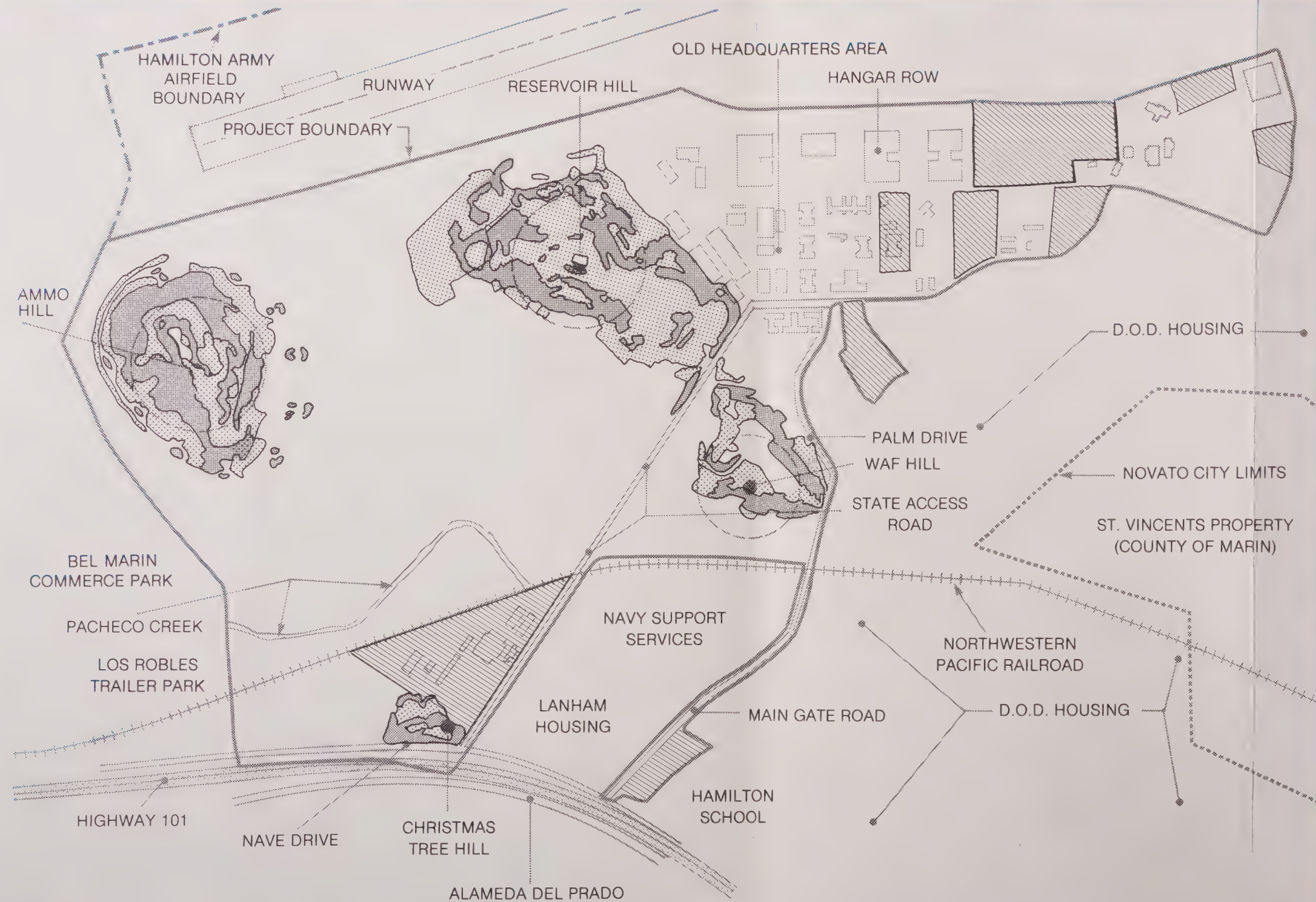
The northern and northwestern part of the site is underlain by alluvium, part of which has been overlaid by artificial fill. The alluvium consists of a mixture of unconsolidated clay, silt, sand and gravel. No data are available regarding the thickness of the alluvium.

The remaining part of the site is underlain by Bay mud, most of which is covered by artificial fill. Bay mud consists of unconsolidated, soft, semi-fluid, highly compressible clay and silt with varying amounts of organic material and occasional sand lenses.

The semi-fluid nature of Bay mud makes it compressible when loads such as structures or artificial fill are emplaced. The fill or structures will settle, sometimes differentially, during several years, decades or centuries before equilibrium is reached. The amount of settlement will vary depending on the thickness of the mud and the magnitude of the imposed load. For example, ten feet of fill placed on Bay mud that is 50 feet thick can be expected to settle 4.5 feet within about a 12-year period, but equilibrium would not be reached until at least 200 years had passed.² If 10 feet of fill were placed on top of 25 feet of mud, a total settlement of 3 feet could be expected, half of which would occur within one year, and the remainder within 20 years.² The site-specific thickness of the

HAMILTON FIELD MASTER PLAN EIR

FIGURE 3.2.1-1



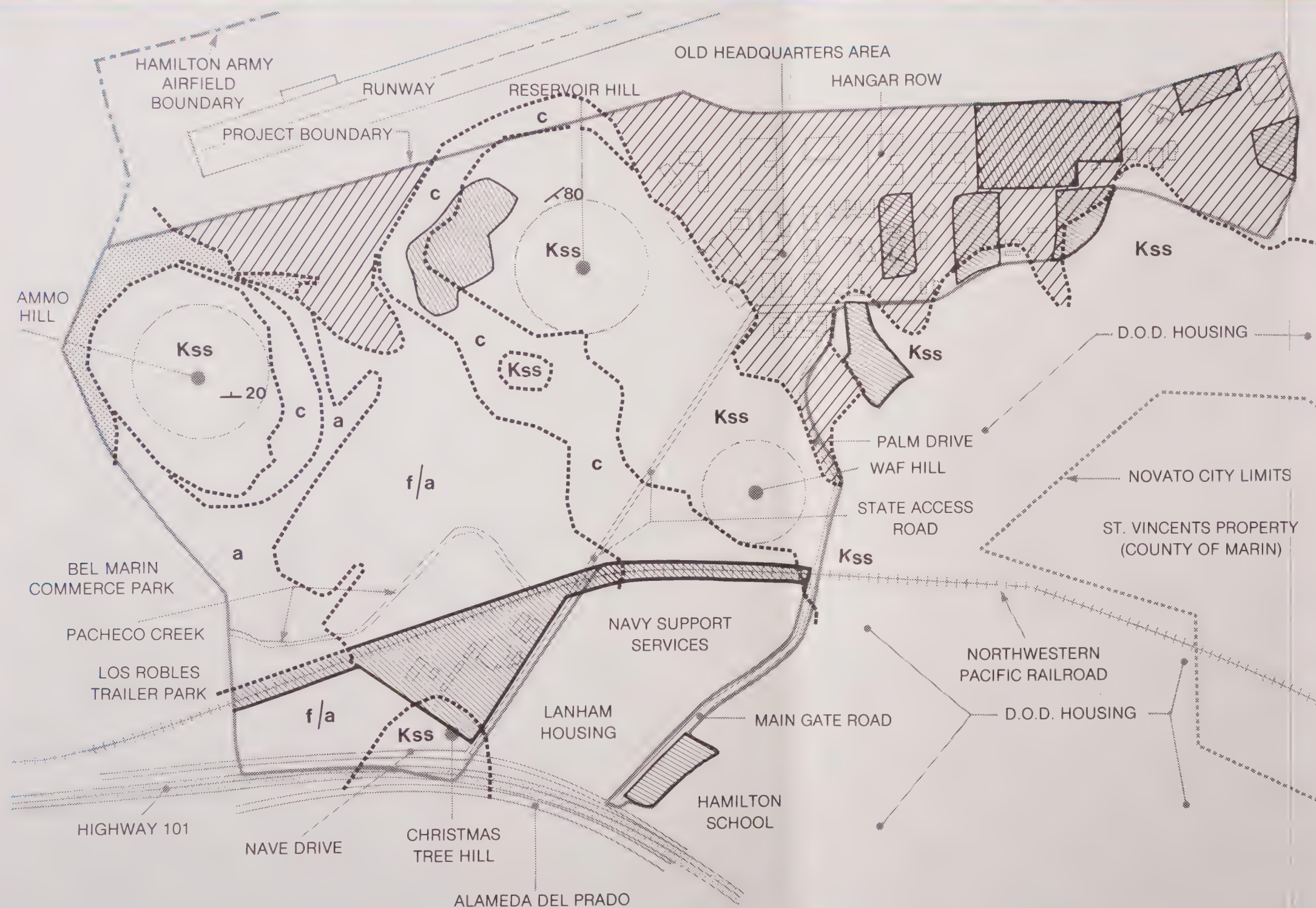
SLOPE MAP



SOURCE: BERG-REVOIR CORP., HAMILTON FIELD
MASTER PLAN. SEP 1987

HAMILTON FIELD MASTER PLAN EIR

FIGURE 3.2.1-2



- Military Holding under Negotiation for Aquisition
- f** Artificial Fill
- Fill Over Bay Mud
- f/c** Fill Over Colluvium
- f/a** Fill Over Alluvium
- a** Alluvium
- c** Colluvium
- Bay Mud
- Kss** Hamilton Field Arkose
- Approximate Contact between Mapped Units
- Bedrock Attitudes (Dip & Strike)

GEOLOGIC MAP



SOURCE: HARDING LAWSON ASSOCIATES
GEOTECHNICAL STUDY, MAY, 1985

Bay mud underlying the major portion of Hamilton Field is unknown. A previous report indicates that in the hangar area, soft material was encountered during pile driving to a depth of 60 feet.³ Site-specific data on Bay mud thickness usually are identified during geotechnical investigations associated with the actual construction of improvements.

Artificial fill covers a large portion of the project site (see Figure 3.2.1-2). The source, quality, and thickness of the material is unknown.³

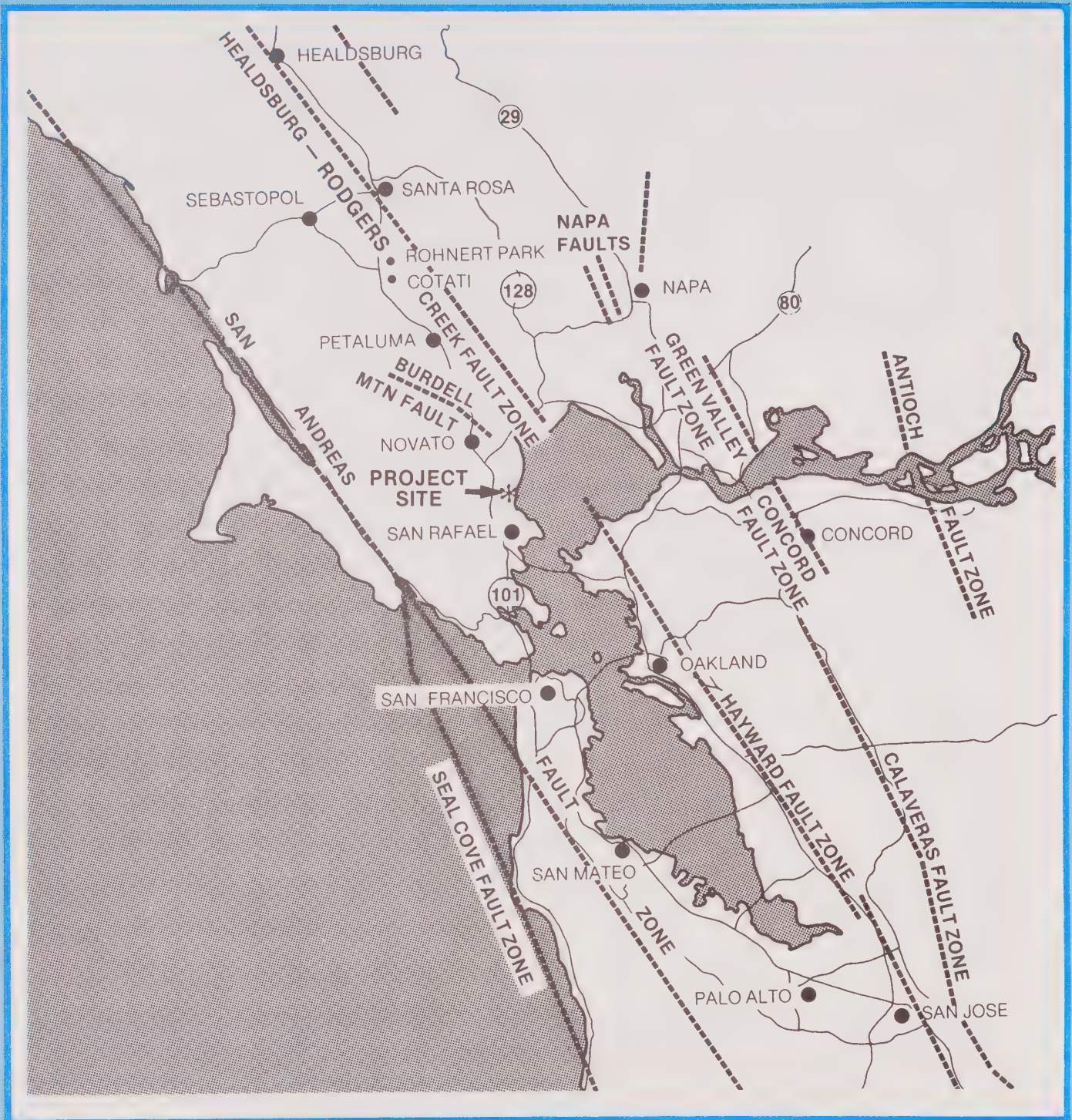
Seismicity

Hamilton Field is located in a seismically active region with a history of large earthquake events. The San Andreas, and Hayward (including its northern extension, the Rodgers Creek) faults are located 14 miles west and 12 miles southeast of the site, respectively (Figure 3.2.1-3). The San Andreas and Hayward faults are considered active by the California Division of Mines and Geology (CDMG).⁴ An active fault is defined by the CDMG as a fault that has shown evidence of movement within the last 11,000 years.

The Rodgers Creek fault, the northern extension of the active Hayward fault is considered potentially active. A potentially active fault is one that has shown evidence of movement within the last 2 million years. The Burdell Mountain fault is located immediately north of the site and trends in a north-northwesterly direction.⁴ The Novato General Plan Safety Element identifies the southern terminus of the Burdell Mountain fault approximately two miles north of Hamilton Field. The fault is considered potentially active by CDMG.

There are no known active or potentially active faults on the project site. The site is within Seismic Zone 4 of the Uniform Building Code, indicating the potential for major damage during an earthquake event along nearby faults.^{2,5}

For areas containing artificial fill overlying Bay mud, liquefaction is a potential hazard during a seismic event. Liquefaction is the transformation of granular material from a solid state into a fluid state as a consequence of increases in pore-water pressures. The effects of liquefaction, which can be mitigated through building engineering design, include lateral movement of the ground surface, foundation failure, and subsidence of the ground surface.



HAMILTON FIELD MASTER PLAN EIR

REGIONAL FAULT MAP

● Approximate Location of Central Business District

MILES 0 5 10 20



FIGURE 3.2.1-3

IMPACTS

PROPOSED PROJECT

The project sponsor has submitted a concept plan for grading portions of Hamilton Field. The following height proposals, pertaining to that plan, form the basis of the grading concepts.⁶

1. The Revised Hamilton Field Master Plan proposes selective areas for cut and fill as shown on Map #20 titled Grading Concepts (Figure 3.2.1-4).
2. The Revised Hamilton Field Master Plan proposes preliminary general contours for project grading. The contours are shown on Map #19 titled Proposed Contours. The Proposed Contours map limits on-site grading requirements by indicating no significant change in elevation in the Historic District and Hangar Road areas of the project. The grading concept and proposed contours propose only selective fill at certain sites and recognize the upgrading of the existing military levees or the construction of a new perimeter dike will provide flood protection. The limit of fill will coincidentally limit import of material requirement.
3. The Revised Master Plan proposes to retain, where possible, existing street patterns and general grades in the Historical District and to retain the major existing arterial right-of-ways grades (e.g. Main Gate Road and State Access Road) which will further limit on-site grading requirements and limit the need of import of material.
4. Christmas Tree Hill has been severely graded on both its Nave Drive frontage and its easterly slopes. The exposed slopes (slopes which have been cleared to bedrock) are not feasible for relandscaping nor are they considered of significant "scenic" value. The grading concept plan does propose removal of the remaining hill and re-grading and re-planting to become a portion of the Nave Drive landscape entry buffer.
5. The Revised Master Plan proposes modified street right-of-way requirements for streets located in moderately sloping areas in order to reduce required site grading operations.
6. The Revised Master Plan proposes to balance on-site cut and fill requirements in order to avoid significant truck transport of fill to the property. This will also limit potentially disruptive construction traffic during respective phase construction.
7. Preliminary geotechnical and soil reports will be submitted with respective phase tentative map applications as required by the City of Novato.
8. Final geotechnical reports will be submitted with final improvement plan application as required by the City of Novato.

Topography

Implementation of the proposed Master Plan would involve grading activities for cuts and fill. The Master Plan has identified certain areas for potential cutting and filling (Figure 3.2.1-4). Areas of major excavation include Christmas Tree Hill along the western site boundary, the berms around the ammunition storage area by Ammo Hill, and selected areas along the eastern site boundary. Major areas proposed for fill include the southern base of Ammo Hill and the northwestern corner of the site. In addition, some areas proposed for development that are located within the 100-year flood plain would be filled to an elevation of ten feet above mean sea level (see Section 3.1.2, Hydrology and Water Quality). These areas, as shown in Figure 3.2.1-4, include about half of The Central Area, about two-thirds of The Runway Edge, and a flood protection levee around Hangar Row. Other site grading generally would alter existing elevations by less than two feet and would reflect existing contours.⁶

No final grading plan currently exists because the proposed project is at the Master Plan stage. The objective of grading activities is to balance cuts and fills.⁷ On-site balancing of cuts and fills would alleviate the need for import or export of material. The use of conventional excavation equipment is expected throughout the site. However, if hard, unfractured bedrock is encountered it could necessitate the use of light, sequential charges to loosen the rock prior to removal.

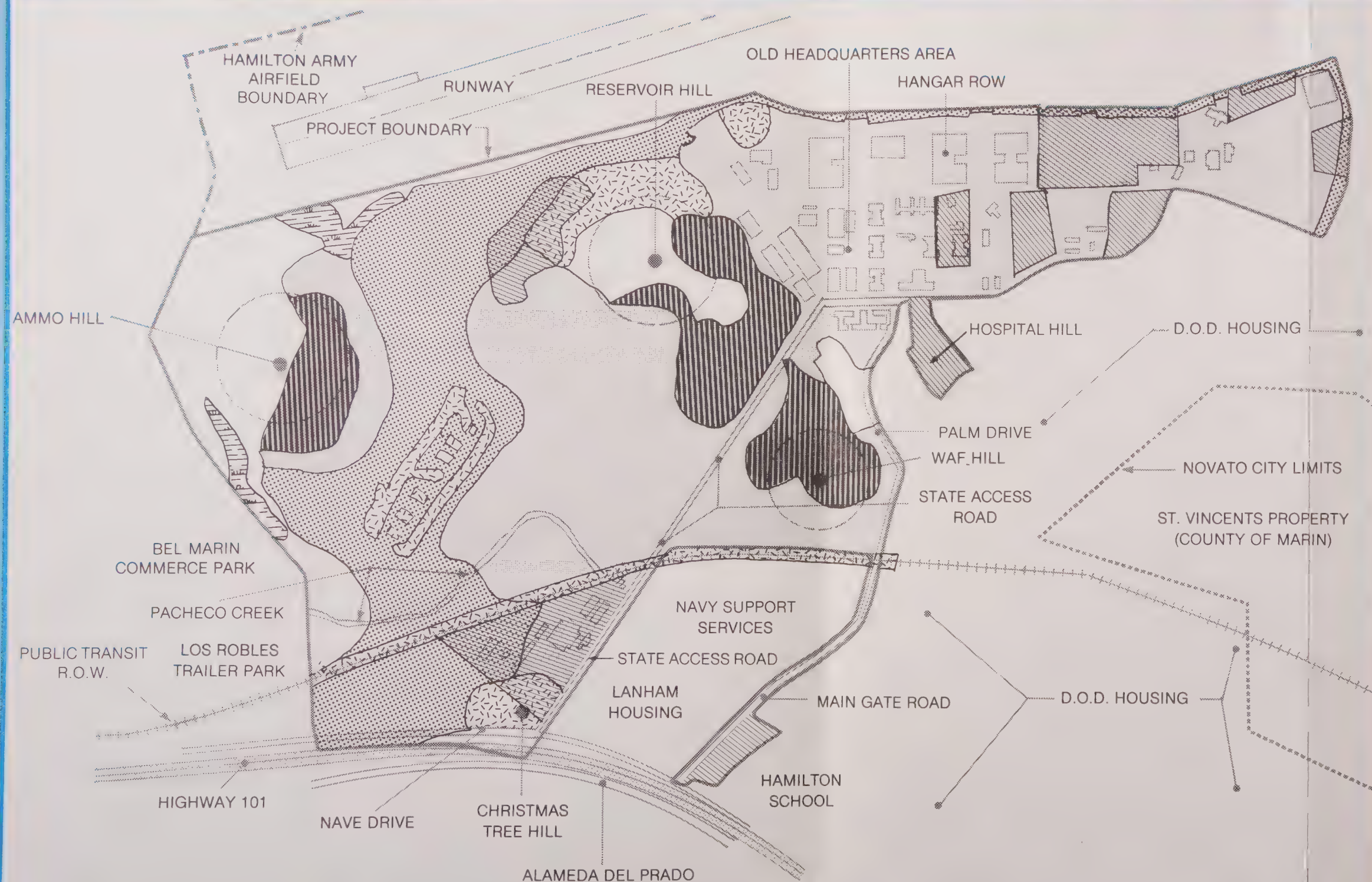
One of the flood protection measures for the project entails the construction of a levee along the eastern project boundary. Material for the clay core of the levee would be excavated from the Bay mud near the northern end of Hangar Row. The northern face of Reservoir Hill or other sources as described below would supply the other material needed, thus eliminating the need to import fill.⁷

If, during final grading design, the currently proposed cuts would provide insufficient fill material, a number of fill sources on the project site could be used, as listed below. These sources are possible alternatives to importing materials from off-site. The final grading scheme would not be available until the site-specific development stage of the project site.

- o The north-side of Reservoir Hill is under negotiation for purchase by the project sponsor. The area previously has been used for a fueling area, and currently is under-

HAMILTON FIELD MASTER PLAN EIR

FIGURE 3.2.1-4



Areas of Minor Cut / Fill
(Generally less than 2 feet)
on Flat Portions of
Property

Hillside Areas of Balanced
Cut / Fill.

Areas of Fill on Flat
Portions of Property to
Achieve Flood Protection
and Drainage.

Areas of Significant
Excavation.

Areas of Minor
Excavation to Create
Seasonal Wetlands

Areas not Subject to
Grading.

Military Holdings
Under Negotiation

GRADING CONCEPTS



SOURCE: BERG-REVOIR CORP. HAMILTON FIELD
MASTER PLAN. SEP 1987

going clean-up for fuel contamination. Considerable amounts of fill material would be available from this location, should it be purchased. The amount of fill material from this former fueling area is estimated to be sufficient to balance the cut and fill on-site.⁷

- o If the fueling area is unavailable as a fill source, additional material could be obtained from expanding the proposed seasonal wetlands area northeast of Ammo Hill. Over-excavation of the housing area on the south side of Reservoir Hill could provide substantial amounts of fill material. Over-excavation of the area proposed for housing on the south side of Ammo Hill potentially would provide substantial volumes of fill.⁷
- o An additional fill material source could include excavated material from the drainage retention pond at the southern end of the airfield, adjacent to the existing pumps. Excavation in this area would be subject to Army approval. Another source of material could be import of fill by rail to alleviate fill transportation impacts on the local road system. Another fill source could be Bay dredge spoils. The Corps of Engineers routinely dredges in the vicinity of San Pablo Bay; current plans exist for dredging in Bel Marin Keys and the Petaluma River.⁸

The topographical impacts associated with cut and fill operations would relate to the visual character of the project site. The visual impacts of the project are discussed in Section 3.1.9 of this EIR.

Geology

During the construction of buildings and infra-structure facilities, vegetation removal would occur from areas currently supporting various plant communities. Denuded soils exposed to the elements have an increased erosion potential over vegetated areas. Runoff from construction areas could contain fine-grained materials, such as silt, that could be washed into the on-site creeks and drainage ditches. This would cause (a) deterioration of water quality in the water ways on the site, and (b) siltation in the retention pond north of the site that empties into Novato Creek (see Section 3.2.2, Hydrology and Water Quality).

Excavation in any of the fractured sandstone hills on the site could result in slope instabilities, depending on the magnitude and slope of the excavations. Slope instabilities could include landsliding, sloughing, and rock sliding.

Settlement

Ground settlement would occur in areas of the project site, underlain by Bay muds (Figure 3.2.1-2), where existing grades would be raised with fill or where heavy structures would

be located. The settlement is a function of the compressibility of Bay mud and the weight of the fill plus the weight of new structures.

The thickness of Bay mud on the project site is less than at the shoreline. Consequently, total settlement, as well as differential settlement, caused by new filling, also would be less than would be expected if fill were placed, for example, north of the airfield. Presumably fill placed in the airfield areas would be more stable than fill placed closer to the Bay.

Settlement of fill (in addition to settlement of underlying mud) also could be an impact if the fill is derived from a dredged source. This would depend upon the characteristics of the dredgings. If the dredged soil is predominantly silty and clayey then the post-construction settlements could be similar to those which would occur in the Bay mud. Dredgings composed primarily of sand would not be susceptible to post-construction settlement unless the sand fill has an extremely low density. In this case, the sand fill could settle if subjected to a sudden shock such as a major earthquake. Low density is only likely to occur if the sand fill is hydraulically placed and not subsequently mechanically compacted.

Uniform settlement would have less significant impact on the project area than differential settlement, which can be expected from a variety of sources. The type and significance of each source is listed in Table 3.2.1-1.

The total amount of uniform settlement is important because it would control the height to which developed areas would have to be overbuilt to maintain an adequate free-board (required floor elevations) to prevent inundation.

Differential settlement would affect the design and performance of utilities, structural foundations and streets. Where differential settlement occurs over short distances, the potential significant impacts include overstressed foundations and buried utilities, wracked building superstructures, reversed gradients in gravity flow pipelines and culverts, and the development of bumps and sags in streets. Potential impacts on buildings include foundation cracking and loss of supporting capacity, possible roof and wall leaks, breaks in building service connections, and other architectural and cosmetic damage.

TABLE 3.2.1-1
DIFFERENTIAL SETTLEMENT IMPACTS

<u>Differential Settlement Source</u>	<u>Level of Impact</u>
Variations in Bay mud thickness	Potentially significant
Presence and thickness of peat layers that remain after grading is completed	Potentially significant
Sloughs and drainage ditch backfills	Potentially significant
Finished thickness differences in fills	Probably not significant
Existing localized high ground	Potentially significant
Differences in construction history	Potentially significant

Settlement occurring as a result of oxidation of the peat is not expected to have an impact. This is because the peat would not be exposed during site grading.

Seismicity

There are several adverse effects related to earthquake-induced vibration. Groundshaking would induce inertial forces in structures located on fill over Bay mud. Seismic waves generated from nearby faults and passing through the soils can lead to lurching of the ground surface. This would damage the utilities and surface improvements. Earthquake groundshaking can increase the pressure within the water found in the pores of sandy soils causing liquefaction. Liquefaction can lead to soil stability failures and settlement of developed areas. Shearing along an active fault could severely damage structural improvements located on the fault trace.

Ground surface failure, such as lurching, can be mitigated by proper site preparation in building areas and by providing adequate building setbacks from channel banks or other slopes. Such site preparations would require recompaction of existing fill and slope protection of additional fill. The techniques are well understood and are part of current engineering practices.

Bay mud, either as fill or in a natural state, is not susceptible to liquefaction. The sandy seams found within or on the Bay mud may liquefy. However, since they are not continuous nor extensive, the impact of liquefaction of these seams on surface settlements and stability would be minimal. Loose, sandy fills located at the ground surface would not have an impact if removed or densified (recompacted) to above liquefiable levels during construction.

All reports indicate that no active fault passes beneath the project site. Therefore, the potential for shear displacements at the ground surface is nil. The presence of a deep layer of soft soil over the bedrock under most of the site would tend to prevent the displacement of bedrock from being manifested at the ground surface.

The specific effect that severe groundshaking would have on structures and other improvements at Hamilton Field depends upon the nature of the structures and the stiffness and thickness of the Bay mud and other soils above the bedrock. The soft Bay mud would attenuate high frequency ground motions and reduce the ground surface accelerations below the levels generated in the bedrock underlying and adjacent to Hamilton Field. However, thick deposits of Bay mud would amplify groundshaking in other frequencies particularly where a high contrast occurs between the vibrational characteristics of the mud and the underlying rock. In Bay mud, or fill over Bay mud, the impact of groundshaking can be reduced through foundation and structural design. Shallow grid foundations would be appropriate for lightly loaded, one- and two-story structures. Pile foundations probably would be needed for taller structures. Driven pile foundations would need to be scores of feet deep to pass through the soft Bay mud to more substantial substrata. Surcharged fill would cause additional settlement on the building site and alter gradients adjacent to the fills.

It is anticipated that bayshore slopes (levee walls) would suffer deformation (outward movements) if the area is subjected to a long duration and high magnitude earthquake. This deformation is caused by inertial forces in the Bay mud which momentarily exceed yield acceleration levels of the Bay mud and capping fill.

Tsunami Inundation

Tsunamis, or seismic sea waves, arrive at the Golden Gate tide gauge at an average rate of once about every five years. The highest were recorded at Fort Point (March 1964, Alaska earthquake) was 7.5 feet and produced a 3.75-foot increase in the existing tide level. Wave height diminished as the tsunami entered the bay, but strong associated currents caused \$275,000 damage to yacht harbors in Sausalito and San Rafael. A ten-foot-high wave at the Golden Gate would cause little flooding damage, but would produce associated strong current damage as described above. Tsunamis generated in the Gulf of Alaska seem to produce higher runups in the seemingly more protected northern parts of San Francisco Bay than in the open areas along San Pablo Bay.

ALTERNATIVE 1: DECREASED HOUSING, INCREASED JOBS

This alternative would substitute about 10 acres of office development for rental residential development in the area between Ammo and Reservoir Hills. This portion of the site contains an unknown depth of fill over Bay mud and is bordered by colluvial deposits on the flanks of the sandstone-cored hills.

The basic geologic-related issues described for the proposed project would apply to this alternative. It is probable that more excavation would be needed for the foundations of office structures because they would be larger than the residential structures. The structures also would be heavier and it is likely that pile foundations would be needed to prevent the impacts of settlement on the buildings and their connected utility lines. The foundations would have to be designed to withstand lateral and vertical forces that would occur during seismically induced groundshaking.

ALTERNATIVE 2: DECREASED HOUSING, DECREASED JOBS

This alternative would substitute about 12 acres of residential development for commercial development west of Reservoir Hill. This portion of the site contains an unknown depth of fill over alluvium and is bordered by colluvial deposits on the flanks of the sandstone-cored hills. The total number of dwelling units on the site would be reduced by about 45%, while commercial square footage would be reduced by about 14%.

The basic geologic-related issues described for the proposed project apply to this alternative; however, the emphasis of impacts would shift slightly with the different treatment of project elements. In the area where uses change from commercial to residential structures, less excavation would be anticipated for foundations, presuming smaller, lighter weight buildings, on larger lots. The larger lot sizes would correspond to the reduced dwelling unit density. Also, it is possible that the lighter structures could be floated on mat foundations or set on spread footings rather than on pile foundations, assuming that the colluvium and alluvium were demonstrated to provide competent support.

In the other residential areas, densities would be reduced. South of Ammo Hill and south/southwest of Reservoir Hill, the lower overall dwelling unit densities would indicate less foundation excavation, assuming similar types of structures were used in this alternative as for the project as proposed. Southeast of Reservoir Hill, where the site is underlain by fill over Bay mud, deep foundations still would be needed because of the impacts of settlement. Seismic design would need to be as described for Alternative 1.

ALTERNATIVE 3: INCREASED HOUSING, DECREASED JOBS

This alternative would substitute about nine acres of housing for recreational/retail development southeast of Reservoir Hill and about 45 acres of rental units for hospital, medical research and retail uses south of Ammo Hill. The nine acre portion of the site contains an unknown depth of fill over Bay mud and is bordered by the sandstone-cored Reservoir Hill. The 45-acre portion of the site contains an unknown depth of fill over alluvium and is bordered by colluvial deposits overlying the lower flanks of Reservoir Hill. The total number of dwelling units on the site would increase by about 8%, while the commercial square footage would decrease by about 41%.

The basic geologic-related issues for the proposed project apply to this alternative; however, the emphasis of impacts would shift with the different treatment of the project elements. As with Alternative 2, where uses change from commercial to lower-density residential structures, less excavation would be anticipated. In higher density areas similar or possibly more excavation would be needed (depending on the originally proposed type of commercial structure being replaced) to provide satisfactory foundation conditions to meet the requirements of seismic/settlement design as described in Alternative 1.

Effects of using fill over Bay mud versus fill over alluvium as foundation support are described for Alternatives 1 and 2.

MITIGATION MEASURES

PROPOSED PROJECT

For each phase of Master Plan implementation, detailed geotechnical investigations would be conducted. The investigations would include evaluation of the settlement, grading, erosion and seismicity conditions and provide recommendations for mitigating identified hazards.

Settlement

The investigations would evaluate, on a site-specific basis, the nature of the subsurface for compatibility with proposed structures and underground utilities. Recommended foundation designs would take into account potential settlement, including differential settlement.

Total and differential settlement can be mitigated substantially by accounting for the estimated amount of settlement during the design construction phase of the project. To do this, the developer's geotechnical engineer conducting the detailed investigations would provide design standards for the conditions found at the various construction sites. The recommendations would depend on the specific conditions, but the types of measures that could be expected are listed in Table 3.2.1-2. Not all the listed measures are appropriate for every building site. The extent and combination or addition of other measures would be determined by the professional judgment of the California licensed geotechnical engineering firm performing the investigations.

Grading

The existing Grading Concepts and Proposed Contours plans indicate that generally less than two feet of cut/fill would occur to alter the surface elevations in the historic Old Headquarters District and Hangar Row, that balanced cut/fills would occur on most of the hills and that the remainder of Christmas Tree Hill would be removed to blend the area with the rest of the site and to supply fill. Modified rights-of-way requirements are proposed in areas of moderately sloping terrain to reduce the amount of grading needed to develop the site. A balanced cut and fill program for the entire site is proposed.

TABLE 3.2.1-2
SETTLEMENT MITIGATION MEASURES

- o Design stiffened shallow foundations with inter-connected deep grade-on-grade or post-tensioned slabs.
 - o Use flexible, buried service connections.
 - o Surcharge existing sloughs, ditches and deep fill-over-mud areas near multi-unit and commercial structure sites.
 - o Use vertical drains to accelerate settlement before buildings are constructed.
 - o Install means for releveling during and after construction.
 - o Replace pockets of loose fill with engineered backfill.
 - o Use deep foundations extending through Bay mud.
 - o Increase gradients at construction stage to account for reversing differential settlements.
 - o Use force mains.
 - o Design street gutters, catch basins and other surface runoff collection and conveyance facilities to include an allowance for expected differential settlement.
-

A detailed grading plan must be prepared and submitted to the City of Novato. The grading plan would be in sufficient detail to estimate import quantities of fill, if the balanced cut and fill program does not appear feasible. For any import of fill, the grading plan must include quantities of import, the source of imported material, and a description of the roads that the trucks would use to carry the fill on-site. If local roads are used, the plan must include a schedule that would reduce impacts to the local community, as well as provisions for clean-up of any spilled materials. Dredging as an alternative to import of fill material should be considered for feasibility. Several sources of dredge spoils could be available within the project vicinity. An alternative to fill import would be to reduce the on-site grading. This would alleviate off-site impacts.

For cut and fill operations on slopes, the geotechnical report would include analyses of slope stabilities. For unstable slopes, recommendations must be included that would mitigate slope instabilities.

Tsunami Inundation

To qualify for flood insurance, all occupied floor levels would have to be above +9 feet msl. This level has been established by the City and adopted by FEMA as the 100-year shore flooding elevation defined by the National Flood Insurance Rate Maps (FIRM) for the City of Novato. Tsunami runup for the 100-year event is calculated by the U.S. Army Corps of Engineers to be about 6.2 feet. If this runup occurred during a high storm tide, it

could be several feet higher and could overtop the recommended FIRM flood levels. Because additional filling to achieve higher freeboard would require more surcharging and would be accompanied by greater settlement in the Bay muds it would appear prudent to avoid the filled-foundation system. Open, light weight, low-occupancy structures would be the most reasonable for the area within the FIRM 100-year flood zone. Such structures would not greatly alter the course of flood waters and would not unnecessarily endanger life or property. For denser uses, levee maintenance is absolutely essential to provide protection. The roles of the Navy, the City and the project sponsor in providing protection for low-lying areas must be defined clearly and agreed upon as discussed in the Drainage and Flooding Mitigation section of 3.2.2 Hydrology and Water Quality in this EIR.

Erosion

For the construction of each phase of the Master Plan implementation, an erosion and sediment control plan would be submitted to the City. The plan must include provisions for control of drainage and discharges to the on-site drainages. In addition, the plan should include recommendations for monitoring the effectiveness of the plan, and describe emergency measures to be undertaken should mishaps occur (see Section 3.2.2, Hydrology and Water Quality).

Seismicity

The impact that the earthquake vibrations would have on levee slope deformation can be reduced by keeping the levees in good repair with suitable shallow foreslopes to provide stability in the levee construction materials (usually dredged Bay mud).

Buildings can be designed to withstand strong earthquake shaking and to suffer only cosmetic and architectural damage and not structural collapse. The potential ground accelerations at the foundation level must be evaluated to determine if the shears and moments mandated by the Uniform Building Code are adequate for the site conditions. In addition, sufficient borings for each development area within the project site should be made to verify that liquefiable, continuous sand layers within Bay mud or saturated fill/alluvium/colluvium do not exist beneath the proposed development sites. If necessary, analysis of the potential impact of liquefaction induced in sand layers present within the Bay mud should be part of the engineering studies. The potentially damaging effects of ground lurching can be mitigated by ensuring that site fills are well compacted.

All construction on-site, including the renovation of existing buildings, should be in conformance with the Uniform Building Code provisions for structures within Seismic Zone 4 as a minimum standard.

ALTERNATIVE 1: DECREASED HOUSING, INCREASED JOBS

ALTERNATIVE 2: DECREASED HOUSING, DECREASED JOBS

ALTERNATIVE 3: INCREASED HOUSING, DECREASED JOBS

The mitigation measures described for the proposed project would apply to each of the alternatives. This is true, first, because the conditions addressed by the measures do not change regardless of the land use and, second, because the impacts of construction and occupation of the site under the alternative proposals vary in intensity and mix, rather than in basic type. Consequently, the same precautions would be needed to protect life and property.

¹Harding Lawson Associates, Geotechnical Study, Hamilton Park, Hamilton Air Force Base, Novato California, Job No. 17,469,022.01, prepared for Berg-Revoir Corporation, May, 1985.

²S.J. Rice, Geology for Planning, Novato Area, Marin County, California, California Division of Mines and Geology, 1975.

³General Services Administration, Draft Environmental impact Statement on Disposition and Use of Federal Surplus Property at Hamilton Air Force Base, Novato, California, April, 1979.

⁴C.W. Jennings, Fault Map of California, California Geologic Data Map Series, Map No. 1, California Division of Mines and Geology, 1975, Second Printing 1982.

⁵Uniform Building Code, May, 1985.

⁶Paul B. Sevy, Vice President, Development, Berg-Revoir Corporation, letter to Ted Adams, Senior Associate EIP Associates, 1 March 1988.

⁷John Stuber, Stuber-Stroeh Associates, Inc., project engineers, personal communications, July 1986 through August 1988.

⁸Patricia Duff, Corps of Engineers, Environmental Branch, San Francisco District, personal communication, 14 July, 1986.

SUMMARY COMPARISON OF IMPACTS AND MITIGATION MEASURES

3.2.1 SOILS, GEOLOGY AND SEISMICITY

	IMPACT	MITIGATION
PROPOSED PROJECT	Settlement: Compression of fill and underlying Bay mud can damage foundations of structures supported on them.	Recompect or replace fills. Remove Bay mud and replace with engineered backfill. Set pile foundations into firm soil or bedrock below Bay mud.
	Seismicity: Groundshaking can shift or damage buildings, generating liquefaction, ground lurching or levee deformation.	Design buildings to Seismic Zone 4 Uniform Building Code requirements as a minimum standard. Locate and replace soils susceptible to liquefaction. Recompect fills susceptible to lurching. Maintain levees with stable slopes.
	Erosion: Excavation and construction can expose soils to water and wind erosion, causing on-site soil loss and downstream sedimentation.	Prepare and enforce an Erosion / Sedimentation Control Plan for the construction period as well as for the occupancy phase of the project.
	Tsunami Inundation: Seismic sea waves can generate strong currents and rapidly changing tide levels, both of which can damage bayside facilities.	Maintain levees above inundation levels as defined by the latest COE studies of the Hamilton Field Area.
ALTERNATIVE 1: (Decreased Housing, Increased Jobs)	Impacts would be the same as for the proposed project.	Mitigation would be the same as for the proposed project.
ALTERNATIVE 2: (Decreased Housing, Decreased Jobs)	Impacts would be the same as for the proposed project.	Mitigation would be the same as for the proposed project.
ALTERNATIVE 3: (Increased Housing, Decreased Jobs)	Impacts would be the same as for the proposed project.	Mitigation would be the same as for the proposed project.

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3.2.2 HYDROLOGY AND WATER QUALITY

SETTING

Drainage

The project site is located within the drainage boundaries of Arroyo San Jose, Pacheco Creek, and the "Hamilton Area" watersheds (Figure 3.2.2-1). The proposed project (Master Plan) and the three alternative plans being considered for the site each would need to deal with the drainage issues raised by development within Hamilton Field. The following discussion pertains to the proposed project and the three alternatives.

Arroyo San Jose and Pacheco Creek are tributaries to Novato Creek. Arroyo San Jose drains a 5.4 square-mile watershed. The creek flows from west to east. The headwaters are near Indian Valley College. From there the creek flows along Ignacio Boulevard and under U.S. 101. The creek empties into a marsh northeast of the Los Robles Mobile Home Park. The marsh is the location of the confluence of Arroyo San Jose and Pacheco Creek. The area of the project site that actually drains into Arroyo San Jose is a small part of the northeastern slope of Ammo Hill. The drainage from Ammo Hill flows into Arroyo San Jose downstream from the confluence with Pacheco Creek.

The eastern part of the project site is drained by Pacheco Creek. The creek has a total drainage area of 1.69 square miles. It flows from a small canyon west of U.S. 101, under the freeway and onto the site near State Access Road through five 60-inch culverts. The culverts empty into concrete-lined and earthen channels that pass through the project site and discharge into the marsh north of the site, where Pacheco Creek meets Arroyo San Jose. The combined flows move to a ponding area north of the runways for eventual discharge into Novato Creek. Discharges from the ponding area into Novato Creek are controlled by flap gates.

The remaining, and major, part of the site is within the Hamilton Area watershed. Flow from this area is collected by storm drains and earthen channels. North of Reservoir Hill the drainage is collected in a ditch that moves the water northeasterly toward the levees along the northern perimeter of the airfield. From there, the water moves in a channel along the inside of the levee toward a retention area in the southeastern corner of the airfield.

Drainage from the remaining part of the Hamilton Area watershed flows in a southerly direction toward a channel that is concrete-lined and earthen in varying places. The channel is located along a levee paralleling the southern and southeastern project site boundaries. The flows in the channel converge in the retention basin south of the runways, in conjunction with drainage from the airfield areas. The ponded water eventually is discharged to San Pablo Bay by nine vertical-lift turbine pumps discharging through eighteen 36-inch steel pipes. The total capacity of the pumps is 105,000 gallons per minute (gpm).¹ The pumping system is a major component of the existing flood protection system for the project site and the Hamilton Field area.

Flooding

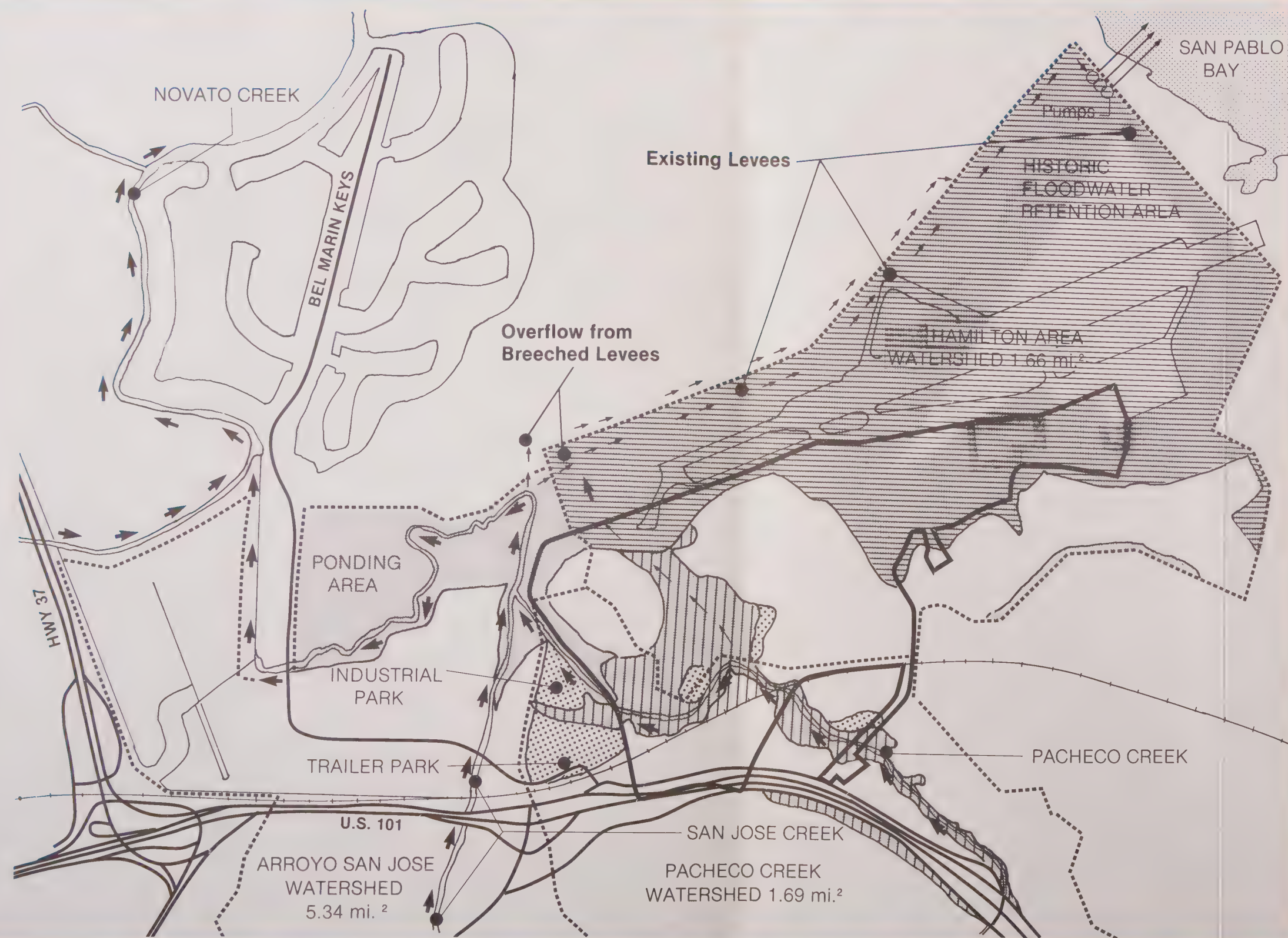
Historic and existing flooding problems exist for the three watersheds in which the project site is located. Figure 3.2.2-1 shows those areas on, and adjacent to, the site that are estimated to be subject to flooding from the 100-year and 100-500 year storm events. The information presented on Figure 3.2.2-1 is from the Flood Insurance Rate Maps (FIRM) prepared for the Federal Emergency Management Agency.² The maps were prepared in 1984 and estimated the flooding levels on the basis of existing development within the different watersheds. The Corps of Engineers is scheduled to complete updating the FIRM for the Novato Creek watershed, including its tributaries, by July, 1988 in response to current and projected development in the area.³ After the Corps of Engineers has completed its data collection and evaluation, the material will be transmitted to the Federal Emergency Management Agency (FEMA) for further action. After FEMA action, new Flood Insurance Rate Maps will become available. The date of issuance of new maps is unknown.

The existing FIRM data indicate that the northern part of the project site is subjected to flooding from the 100-year storm event, as well as areas along Pacheco Creek and the flat-lying areas on the eastern project boundary.

Directly north of the project site, where Arroyo San Jose and Pacheco Creek converge, flooding is estimated for the 100-year and the 100-500 year storm events. The major cause of flooding at the Arroyo San Jose and Pacheco Creek confluence is the inability of the ponding area north of the project site to discharge inflowing water in a sufficiently timely manner into Novato Creek. As a result, inflowing water backs up and floods the

HAMILTON FIELD MASTER PLAN EIR

FIGURE 3.2.2-1



- Areas Within the 100 yr Flood Elevation
- Areas Within the 100-500 yr. Flood Elevation
- Shallow Overland Flow 100-500 yr Event
- Possible Tidal Flooding in Event of Levee Failure

- Direction of Flow
- Direction of Overflow
- Direction of 100 yr Event Overflow
- Watershed Divide
- Hamilton Field Boundary

EXISTING FLOOD PLAIN

NORTH

FEET
0 400 800 1600

eip

SOURCE: BERG-REVOIR CORP., HAMILTON FIELD MASTER PLAN, DEC. 1985

upstream areas. The concrete lined channel of Pacheco Creek is not sized to accommodate these backups. Poor creek maintenance on privately owned channel portions aggravates this problem and increases the size of the area subject to inundation during heavy storm events.

The Los Robles Mobile Home Park, adjacent to the northeastern project site boundary is located within a 100-500 year flood plain, according to FIRM data. Even during storm events that may not be designated as a 100-500 year event, flooding is occurring in the mobile home park, as reported by the park owners.⁴

In addition, shallow overland flows are occurring for the 100-500 year event south and southeast of Ammo Hill and along certain parts of Pacheco Creek. Poor maintenance of the creek channel and riparian vegetation may be the main contributor to this problem.

The area of the project site located within the Hamilton Area watershed is subject to potential inundation through levee failures or overtopping. The Hamilton Field area is protected by man-made levees along the eastern, southern, and southwestern perimeter. However, poor maintenance of the levees (in some places, breaching of the levees) and local and regional subsidence has resulted in limiting their effectiveness to protect the area, including part of the project site, from flooding.⁵

Water Quality

The quality of the surface water on the project site is influenced by activities throughout the three watersheds, as well as conditions on-site. Water bodies of concern are the Arroyo San Jose, Pacheco Creek, the ponding area north of the site, and the water eventually discharging to San Pablo Bay by the pumps, located southeast of the site.

There are no quantitative surface water quality data for any of the listed surface water bodies.^{6,7,8} However, on the basis of observations made by EIP Associates (reconnaissance, July 1986 through February 1988) and by Marin County Flood Control and Water Conservation District, extensive siltation occurs in the creeks.⁶ This would indicate that turbidity could be a problem during certain times, e.g., following storm events.

While no water quality samples have been collected from the pond area north of the project site, putrification has not appeared to be a problem for the area.⁶ This indicates that the creeks emptying into the pond apparently are not carrying excessive amounts of nutrients.

The effects on surface water quality from past waste disposal practices on the base is unknown, because no sampling has occurred. The Army currently is in the process of performing remedial actions for identified contaminants on and near the project site. Surface water sampling has not been part of the confirmation studies or remedial actions performed to date.^{7,8}

All Other Alternatives

Each of the alternatives would occupy the same physical area of the site as the proposed project. Consequently, regardless of land use mix, the areas planned for human occupancy (2000 hours or more per year) would need to be protected from flooding. Although such flood protection measures as minimum floor elevations may vary slightly with specific uses, others, such as levee heights and drainage channel capacities, must meet the most conservative standards of any use mix. Because the alternatives contain generally the same elements as the use mix for the proposed project, the standards which must be met are the same. The Impacts and Mitigation Measures discussed in the following sections of this chapter apply to the alternatives as well as to the proposed project.

IMPACTS

PROPOSED PROJECT

Drainage and Flooding

Construction of the proposed Master Plan would result in a change of the existing vegetative cover and the topography of the site as well as an increase in impervious surfaces of 228 acres.¹ This would cause runoff volumes to increase and time of runoff concentrations to decrease during storm events. The management of the site drainage and storm flows has been proposed by the project sponsor as part of a master conceptual flood management plan, described below.

In order to alleviate the existing flooding problem on the project site, a Conceptual Flood Management Plan has been developed for the Hamilton Field site.² The plan consists of improvements to Pacheco Creek channel and the levees surrounding the perimeter of the runway and Pacheco Pond (Figure 3.2.2-2).

Pacheco Creek would be realigned in twin underground culverts (probably 96 inches in diameter) from south of State Access Road, parallel to the future transit corridor, across the corridor near the western boundary of the project site, to reenter the existing channel west of the new main entrance road. The pipes and channel would be sized to accommodate the 100-year flow. The realignment of the creek would include the creation of a new channel near the north boundary of the project area that would connect the existing channel with Pacheco Creek, bypassing the clogged portion of the channel. The purpose of the new channel would be to provide flood protection for the lowlying area of Los Robles Mobile Home Park adjacent to the project site.

The location of the crossing of the transit corridor is important to avoid disrupting rail traffic with unnecessary or rapid grade changes, therefore the more westerly options are more favorable. Reducing the number of sharp changes in direction also is favorable to controlling erosion and sedimentation, and to reducing the maintenance needs within the channel.

High water elevations in Pacheco Pond would be controlled by a weir in the levee between the Hamilton runway and the pond. At that point drainage from Pacheco Pond would overflow through the weir into an earthen ditch paralleling the levee along the north and northeastern side of the runway area. The flows from the ditch would move toward the pumps located in the northeast corner of the runway area for eventual discharge into San Pablo Bay. Ponding could occur in the area surrounding the pumps where about 800 acre feet of storage capacity is available. The channel south of Ammo Hill, whose subterranean watersource is unknown, would be filled.

A new levee would be built east and north of Hangar Row to protect existing and future buildings in that area from flooding in the event that new levees south, east and north of the airfield were not constructed or that the existing or new levees failed. The alternative of demolishing the buildings and adding sufficient fill to bring floors above the

base flood level was rejected as too massive an undertaking for this project. The new levee would have portable partitions to provide access to the runway for those hangars that would be separated from the runway by the levee. If the runway were flooded, the closed partitions would protect the hangars, but would prevent access to the runway. Otherwise, it is not anticipated that the partitions would affect runway operations. For the protection of the airfield, the existing levees would need to be repaired and maintained. It is assumed by the project sponsor that the perimeter levee repairs and construction would be undertaken by the Army. A federal project of that sort would require a consistency determination from the San Francisco Bay Conservation and Development Commission (BCDC). If the project sponsor undertook to repair the perimeter levee a permit from BCDC would be required.

For those undeveloped areas on the site proposed for development and located within the 100-year flood plain, up to 3 feet of fill would be put into place to raise the ground level to elevations ranging from +6 to +10 feet msl (mean sea level) in accordance with City of Novato requirements. According to the FIRM data, the 100-year flood elevation in the area between Ammo Hill and Reservoir Hill is +6 feet msl. The estimated 100-year flood elevation of the ponding area north of the project site is +8 feet msl.

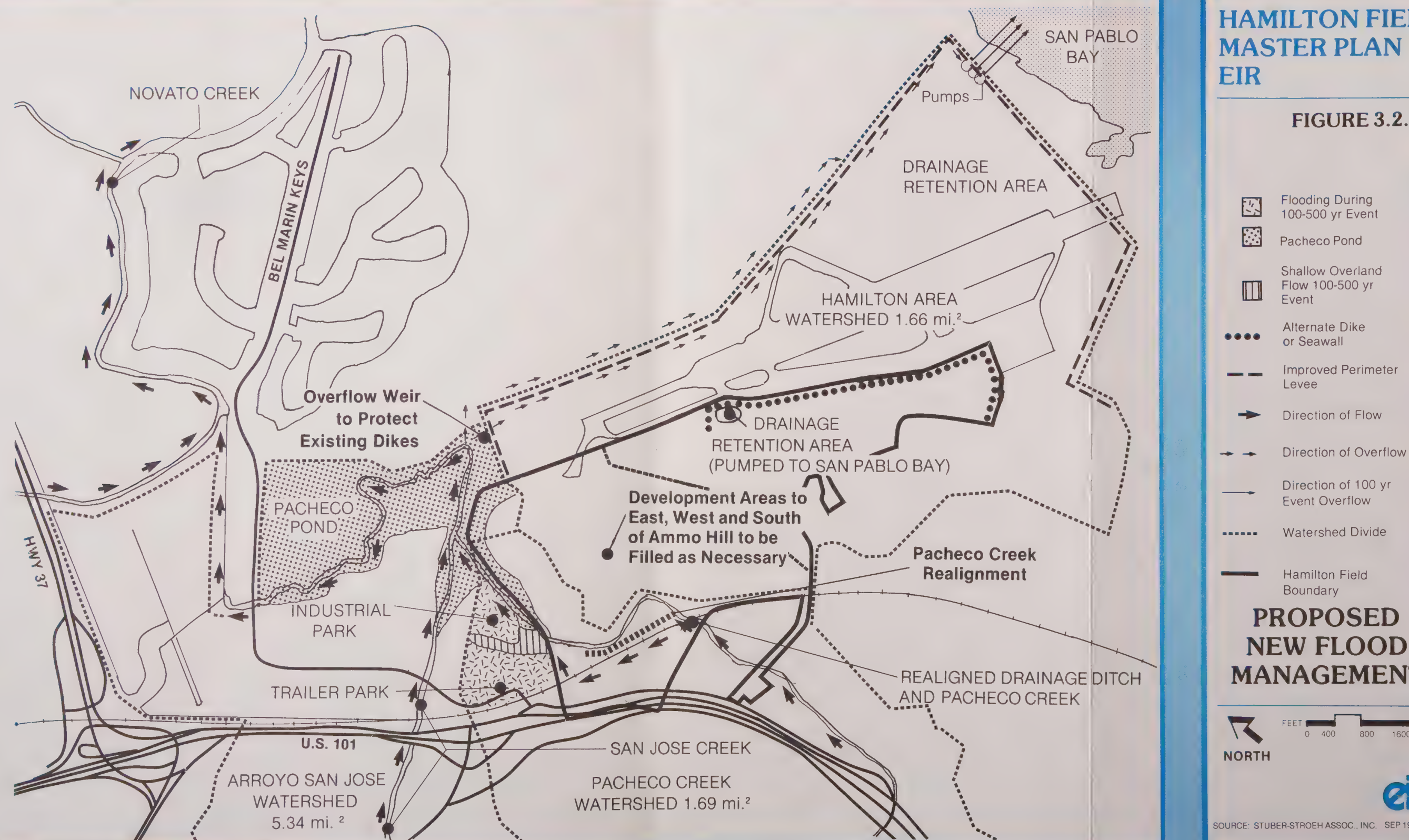
The Federal Emergency Management Agency has defined requirements for new construction or substantial improvements of existing buildings within identified flooding areas. All new construction on the project site would be required to conform with these standards.

The proposed flood protection measures for the project site are conceptual in nature. Although they could provide flood protection for the site, the actual implementation of the proposed measures is uncertain. The proposed plan only could be implemented through cooperation with the Army and Navy. Permission would be needed to use part of the runway areas for retention of project site drainage, for possible funding for levee repair and maintenance, for future operation of the Navy's pumping station, and for drainage channel maintenance.

Other institutional options for providing the necessary flood-proofing of the site could include work by the Army Corps of Engineers. The Corps conducts flood-proofing projects

HAMILTON FIELD MASTER PLAN EIR

FIGURE 3.2.2-2



in areas prone to flooding when benefits to a community exceeds the costs of flood-proofing. It is unknown whether flood-proofing of the project site could become a Corps project. It is the subject of a current study, the results of which will be available within the next four months.

In addition to negotiations between the Army and the project sponsor to agree on future procedures and funding for flood protection, requirements of Marin County Flood Control and Water Conservation District and the City of Novato would have to be adhered to for the proposed flood control plan to be effective. The project sponsor would have to develop a Drainage and Flood Control Plan, with the District, that would address the District's design storm criteria. These would include the effects of a 72-hour storm in combination with an antecedent storm on the level of Pacheco Creek, the Novato Creek flood profile, the change in storage capacity, and the capability of existing pumps to accommodate the volume of runoff water generated by such a combination of storms. Other items of necessary discussion and agreement include, but are not limited to, the consideration of freeboard and drainage profile necessary to accommodate the projected rise in sea level over the useful lifetime of the project (up to 2.6 feet by the year 2050)⁹, the difficulty of maintaining closed conduits in sediment-free condition, formal agreements with the Navy (pumping operation) and the adjacent owners whose lands may receive stormwater discharge from the project.

The Flood Control District currently has easements and ownership along certain parts of the Pacheco Creek and Arroyo San Jose. The District maintains levees and channels along areas over which they have jurisdiction. On the project site, the District does not have easements along the channels and ditches or levees. Therefore, the District does not maintain any water courses on-site. Following construction of channel improvements on the site, the project sponsor could offer easements along the water courses to the District. The District would have the prerogative to accept or decline the easement. Declining the easement would result in the project sponsor having the responsibility of maintaining the water courses on the project site. If the on-site water courses were to be maintained by the project sponsor, this could be achieved through a form of assessment district.

The City of Novato has jurisdiction over all of the water courses on the site in so far as code enforcement and planning activities are concerned. Following site development, the City would have the responsibility of maintaining culverts in City rights-of-way. The City of Novato requirements for flood protection would have to be adhered to in the flood protection scheme proposed for the site. This would include construction activities in compliance with FEMA requirements.

Water Quality

Implementation of the proposed Master Plan could impact the surface water bodies at and near the site during construction as well as during operation of the project.

Unless properly controlled, construction activities, site preparation, roadway construction, and grading, would result in significant erosion and ensuing sediment load increases in Pacheco Creek, on-site ditches and channels, and in Pacheco Pond. Vegetation clearing would increase surface runoff, resulting in the potential for channel bank erosion and increased sediment loads from those areas where the channels are not concrete-lined.

Dislodged soil, washed off the construction sites, could result in increased sedimentation in downstream areas. This would increase the turbidity of the channel waters and could increase flood hazards in areas of sediment deposition. These impacts would be most severe if any construction activities were to take place during the rainy seasons.

During the life of the project, the quality of stormwater runoff would change by the addition of typical urban pollutants. These include wind-blow silt and clay, pesticides, heavy metals from automobile emissions, grease, oil, and litter.

The Master Plan includes proposals for research and development facilities. If these facilities were to use hazardous materials as part of their operation, transportation of chemicals to and from the facilities could involve accidental mishaps. During such accidents, chemicals may spill into adjacent water courses, resulting in water quality degradation.

The quality of water flowing into the Pacheco Pond could change if the proposed master plan were implemented. The nutrient levels could increase if fertilizers were applied to initiate riparian vegetation along on-site waterways. During the life of the project, nutrient levels may decrease over existing conditions, if creek maintenance is adhered to, and fertilizer use reduced to the minimum necessary to maintain growth.

ALTERNATIVE 1: DECREASED HOUSING, INCREASED JOBS

ALTERNATIVE 2: DECREASED HOUSING, DECREASED JOBS

ALTERNATIVE 3: INCREASED HOUSING, DECREASED JOBS

Hydrology and water quality impacts relating to the project as proposed would generally be equally applicable to Alternatives 1, 2 and 3.

MITIGATION MEASURES

PROPOSED PROJECT

Drainage and Flooding

The Federal Emergency Management Agency (FEMA) has certain requirements for new construction and substantial improvements within flood-prone areas. These include provisions for finished floor elevations, emplacement of fill, and flood-proofing of utility and sanitary facilities. The FEMA requirements would have to be met by the project sponsor to construct new structures within the identified floodways on the project site, and the flood protection structures would need to be certified by registered professionals that they provide protection in accordance with FEMA requirements.

The design and magnitude of flood protection requirements should be determined after more detailed studies have been completed either by the project sponsor or by the Army. Of particular concern is the applicability of previously used data for determination of flooding levels on-site. It is known that the areas supporting the perimeter levees are actively subsiding. The study by the Air Force indicates that from 1955 to 1963 the perimeter levee subsided and/or eroded from +7 feet to +6 feet msl, a decrease of one foot in less than ten years.⁵ Updated data are needed to design properly a flood protection scheme for the site.

The flood protection scheme also should incorporate consideration of the potential long-term rises in sea levels in response to global changes in meteorological conditions. The San Francisco Bay Conservation and Development Commission recently has published data on the potential effects on developments from accelerated sea level rises.¹⁰ Over the next 100 years, sea level changes may result in an increase in water levels of up to 4 feet. This is an important consideration for levee construction for flood protection purposes.

Other factors to be included in development of flood protection levees should be recent data on tides, and provisions for multiple storms, when estimating flood elevations on the site and in Pacheco Pond.

The project sponsor, and the Army and the Navy would need to cooperate with the Army Corps of Engineers in floodway elevation developments. It is important that a coordinated inter-agency flood control and drainage maintenance plan and program for the watersheds be established. The Navy currently has housing developments outside the project site and outside the designated 100-year floodway. However, the Navy may construct future housing at lower elevations, potentially in the floodway. A comprehensive flood protection scheme should include consideration of future Navy housing. As described above, the Corps of Engineers is scheduled to update the FIRM maps for the project area within the next year. These maps will contain the determining factors for the design of flood protection plans for the project site.

Responsibility for flood protection improvements on and near the project site must be established prior to the development of the affected areas. It has been the project sponsor's experience that firm commitments regarding the disposition of maintenance responsibilities among the City of Novato, the Marin County Flood Control and Water Conservation District and any private parties concerned were made during review and approval of improvement plans.¹¹ The County, in reviewing the Notice of Preparation for the project, noted that it was not possible, at that time, to distinguish between publicly and privately financed improvements. Consequently, it is vital that the responsibility for flood protection be established, at least in terms of concept, if not in a final agreement, as early as possible to allow the agencies involved to consider the implications for their own organizations. If an agreement has not been reached at the time of preparing precise development plans, a concept plan should be submitted to the City, by the project

sponsor, delineating the responsibilities for flood protection and maintenance of flood protection structures, as perceived by the project sponsor, including the pumps located southeast of the runway, if they are to remain an integral part of the project sponsor's flood protection scheme. In addition, a plan should be submitted to the City of Novato indicating the specific hydraulics of the proposed flood protection scheme to ensure that the plan would provide adequate flood protection on-site while not affecting off-site properties.

The responsibility for maintenance of on-site water courses has not been established yet. Currently, the Marin County Flood Control and Water Conservation District does not have jurisdiction over project site maintenance. The project sponsor should submit for review by the District, a plan for creek, channel, conduit and retention basin maintenance on-site, as well as a program for cooperative efforts for maintenance of channels along the northern site boundary affected by the holding pond during storm events.

Water Quality

To reduce the impacts to surface water quality, detailed temporary and permanent erosion and sediment control plans should be submitted to the City and to Marin County Flood Control and Water Conservation District for review and approval. The plan should include provisions for the following factors, and should use the Regional Water Quality Control Board's (RWQCB) guidelines as a minimum standard:

- o Maintain existing riparian vegetation to the extent possible and establish riparian vegetation along denuded or new channel sections. Provide justification for selection of specific plant materials; preference should be given to native plants that would require minimal irrigation, fertilization, and pesticide control.
- o Keep construction activities near water courses to the minimum necessary for project development.
- o Discharge runoff into small drainages at frequent intervals to avoid build-up of large, potentially erosive flows; provide erosion protection at all discharge points.
- o Install energy dissipators to reduce runoff velocities.
- o Keep runoff away from disturbed areas during construction.
- o Trap sediments before they leave the site or reach water courses.

- o Plan excavation, construction and grading activities to occur during the low rainfall period (April to October), unless specifically permitted by the City and Marin County Flood Control and Water Conservation District.
- o Establish a monitoring program to oversee the effectiveness of the plan.

To reduce or avoid the impacts of urban pollutants to surface waters, the project includes provisions for frequent street cleaning, control of pesticides, control of direct dumping of pollutants into the storm drain system, and installation and cleaning of catch basins on a regular and frequent basis. The responsibilities for these activities should be stated clearly by the project sponsor prior to precise plan approval.

Stormwater discharges from point sources will be regulated in the future by the U.S. EPA; the state enforcing agency for the new regulations will be the Regional Water Quality Control Board. The new regulations will require permits for stormwater discharges to the waters of the State. The actual method of implementing the new regulations is unknown, but local districts, cities or counties may be required to file a permit on a watershed basis with the regional water boards.¹⁰ The permit applications originally were scheduled for issuance by December 1987, but the program has been delayed. The proposed project would be expected to be a participant in the permit program whether it would be completed or yet to be constructed. Water quality sampling activities may be included in the permit program. An analysis of the expected quality of the runoff generated by the site is required by the RWQCB, including an estimate of solids, biological oxygen demand, oil and grease, and coliform loading. Comparison with existing stormwater pump discharge quality would indicate any changes generated by the proposed project. Steps being taken to develop a coordinated stormwater management plan with the Flood Control District need to be identified and discussed with the RWQCB.

None of the wetlands mitigation areas proposed as part of the project are planned as ponding areas for urban runoff. However, some urban pollutants may enter seasonal wetlands proposed along the eastern side of the project site. Studies have been completed on the ability of wetlands to absorb and immobilize urban pollutants.^{12,13} The type of pollutants studied include oil and grease, metals, and nutrients. It appears that bacteria partially metabolize oil and grease; that metals, under non-acidic conditions, are complexed into accumulating sediments and immobilized unless subjected to acid

conditions; and that nutrients are absorbed by plants.¹⁴ While these observations have been made in the field, the actual effectiveness of the pollutant removal processes depends, to a large degree, on various factors in the wetlands environment, such as hydraulics and plant species. The design of the wetlands proposed on the project site has not been finalized and will be subject to extensive agency review prior to implementation. It is recommended that the Association of Bay Area Governments (the author of current pollutant removal studies in marshes) be consulted during the design process to ensure that pollution control practices, such as the use of catch basins, settlement systems and street/parking lot sweeping, are employed appropriately to protect the wetlands.

To protect surface water quality from degradation caused by potential accidents from spillage of hazardous materials, any tenant on the project site using or generating hazardous materials would be required to develop a spill contingency plan and submit the plan to the City prior to occupancy. The plan would be implemented in the event of a spill. Certain structural precautions, such as berms around fueling and loading areas, and catch basins in drainage lines, should be included in the plans.

The project sponsor has included the following mitigation measures in the proposed plan to reduce impacts on hydrology and water quality.¹⁵

- o Site drainage improvements would be consistent with the City of Novato Development Standards Ordinance and, where applicable, with Marin County Flood Control and Water Conservation District standards.
- o At the submittal of improvement plans for each phase, an erosion control plan would be prepared consistent with the City of Novato Development Standards Ordinance.
- o All land lease or sales agreements and Property Owners Association CC&R's would include provisions requiring compliance with applicable water pollution and waste water treatment requirements.
- o Employment building sites, support commercial sites, open space and park sites would incorporate the provision of waste receptacles. Waste receptacle locations would be identified at building design review or at the final improvement plan stage whichever is applicable.
- o Prior to submittal of improvement plans for respective phases the Marin/Sonoma Mosquito Abatement District would be consulted for review and coordination of control measures.
- o Isolated and scattered existing wetland pockets would be consolidated, thereby localizing potential mosquito vector habitat.

ALTERNATIVE 1: DECREASED HOUSING, INCREASED JOBS
 ALTERNATIVE 2: DECREASED HOUSING, DECREASED JOBS
 ALTERNATIVE 3: INCREASED HOUSING, DECREASED JOBS

Mitigation required for hydrology and water quality impacts relating to the project as proposed would generally be equally applicable to Alternatives 1, 2 and 3.

¹ Stuber-Stroeh Associates, Inc., Drainage and Flooding Report, Hamilton Field Project, Novato, California, 7 October 1986.

² Federal Emergency Management Agency, Flood Insurance Rate Maps, City of Novato, California, Community Panel Numbers 060178-0005, 0005B, 0007, and 0007B, 3 April 1984.

³ Kelley Aasen, Engineer, Corps of Engineers, San Francisco Office, personal communication, 9 July 1986.

⁴ Hillsboro Properties, letter to Berg-Revoir Corporation, 28 April 1986; and letter from Ray Wryysinski, Civil Engineer, to Hillsboro Properties, 21 April 1986.

⁵ Major William R. Landis, A Survey of Erosion, Drainage and Flooding Problems of Concern to Hamilton Air Force Base, California, prepared for 78th Civil Engineer Squadron, Hamilton Air Force Base, California, November 1963.

⁶ Don Engler, Biologist, Marin County Flood Control and Water Conservation District, telephone communication, 7 July 1986.

⁷ Dan Murphy, Presidio Environmental Staff, Department of the Army, Presidio of San Francisco, telephone communication, 7 July 1986.

⁸ Woodward-Clyde Consultants, Hamilton Air Force Base GSA Sale Area Conformation Study of Surface and Subsurface Hazardous Materials Contamination, Final Report 25 October 1985, prepared for the Department of the Army, Contract No. DACW45-84-D-0129, October, 1985.

⁹ Philip Williams and Associates, An Overview of the Impact of Accelerated Sea Level Rise on the San Francisco Bay, prepared for San Francisco Bay Conservation and Development Commission, December, 1985.

¹⁰ Steven Hill, Regional Water Quality Control Board, San Francisco Bay Region, telephone communication, 7 July 1986.

- ¹¹Paul B. Sevy, Vice President, Development, Berg-Revoir Corporation, letter to Ted Adams, Senior Associate, EIP Associates 4 April 1988.
- ¹²E. Chan and T. Bursztynsky, The Use of Wetlands for Water Pollution Control, prepared by ABAG in association with Ramlit Associates, November, 1981.
- ¹³E. Chan, Engineer, ABAG, personal communication, 12 July 1986.
- ¹⁴E. Chan and T. Bursztynsky, 1981, op. cit.
- ¹⁵Paul B. Sevy, Vice President, Development, Berg-Revoir Corporation, letter to Ted Adams, Senior Associate, EIP Associates 1 March 1988.

SUMMARY COMPARISON OF IMPACTS AND MITIGATION MEASURES

3.2.2 HYDROLOGY

	IMPACT	MITIGATION
PROPOSED PROJECT	<p>Site Drainage: Runoff volumes would increase and time of concentration would decrease with the addition of impervious surfaces, thereby aggravating existing on-site flooding conditions.</p> <p>Flood Protection: Parts of the project site would be subject to 100-year flooding.</p> <p>Water Quality: Dislodged soils from construction activities could increase turbidity of surface waters. Hazardous compounds from R&D industries and urban contaminants from developed areas could enter surface waters through the drainage system.</p>	<p>Pacheco Creek channel would be realigned and improved to accommodate additional runoff. High water levels in Pacheco Pond would be controlled by a weir, an overflow ditch and pumps to San Pablo Bay.</p> <p>If the existing levee around the airstrip is not repaired, a new levee would be built east and north of Hangar Row, and would have portable partitions to provide access to the runway. Flood control and drainage responsibility must be established to ensure maintainance of the facilities.</p> <p>Temporary and permanent erosion and sediment control systems would be incorporated in the development plans for the site. Installation and cleaning of catch basins would reduce the amount of urban contaminants entering the drainage system. Spill contingency systems would be incorporated in the R&D designs.</p>
Alternative 1: (Decreased Housing, Increased Jobs)	Impacts would be the same as for the proposed project.	Mitigation would be the same as for the proposed project.
Alternative 2: (Decreased Housing, Decreased Jobs)	Impacts would be the same as for the proposed project.	Mitigation would be the same as for the proposed project.
Alternative 3: (Increased Housing, Decreased Jobs)	Impacts would be the same as for the proposed project.	Mitigation would be the same as for the proposed project.

3.2.3 VEGETATION AND WILDLIFE

SETTING

Plant Communities and Wildlife Habitat

Hamilton Field is located immediately west of and adjacent to San Pablo Bay at the mouth of a valley between Big Rock Ridge (1,905 feet in elevation) to the south and Burdell Mountain (1,590 feet in elevation) to the north. This region of Marin County is to a great extent shielded from the direct climatic influences of the Pacific Ocean due to the intervening ridges and mountains. As a result, the summers are warmer and the winters cooler and drier than in the more western parts of Marin County nearer the Pacific Ocean.

The biologic resources in the Novato region have been grouped into six biotic communities: marshlands, grasslands, oak savannah, oak woodland, riparian and urban.¹ The Hamilton Field Master Plan area supports all six of these biotic communities. A Generalized Vegetation Map is presented in Figure 3.2.3-1. The acreage of each community at Hamilton Field (within the project site) is shown in Table 3.2.3-1.

As indicated in Figure 3.2.3-1, the greatest extent of native biotic communities on the project site is at the north end of the site around Ammo Hill. This area is biologically important because it supports a high diversity of native biotic communities and ecotone areas that typically support the greatest diversity of wildlife species.² In addition to this habitat diversity, the Ammo Hill area also supports two of the most valuable biotic communities within the region: riparian woodland and freshwater marshland. The general characteristics and important features or significance of each community is described below.

Urban. Urban areas are principally located at the east end of the site. These areas are characterized by buildings surrounded by landscape plantings, much of which is of non-native species, and open grass or weedy areas. The native vegetation has essentially been removed and replaced with landscape plantings of palms, eucalyptus trees and various non-native brush species. The most common wildlife species associated with the urban classification include the starling, mourning dove, barn swallow, American robin, house finch, house mouse and pocket gopher. On occasion, a raccoon, skunk or hawk would

TABLE 3.2.3-1
VEGETATION ACREAGE

<u>Plant Community</u>	<u>Acreage¹</u> <u>(Approx.)</u>
Oak Woodland/Savannah	73
Riparian	8.5
Marshland	15
Grassland	<u>131.5²</u>
Total	228 Acres

¹Plant community boundaries were approximated and acreages were computed with a planimeter. The Riparian and Marshland community acreages were defined by the U.S. Army Corps of Engineers.

²The 44 acres of military inholdings of urban and disturbed grassland are not included in these figures.

venture into the urban areas to scavenge or hunt for food. The wildlife value and significance of the urban biotic community is not high when compared to the other five biotic communities.

The portion of Pacheco Creek on the project site that is concrete lined supports some cattail and willow growth providing limited wildlife habitat. This vegetation has become established on the channel due to lack of maintenance by the military. Willows and cattails have become established on sediment deposits on the channel bottom. This portion of Pacheco Creek has not been classified as a wetland by the Army Corps of Engineers.

Grassland. The vegetation of the grasslands is a mixture of predominately introduced European annual grasses and forbs, and California native spring wildflowers. The dominant plant species are wild oat, Italian rye grass, barley, brome, fescue, yellow star

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FIGURE 3.2.3-1

-  Oak Woodland / Savanna
-  Grasslands*
-  Riparian
-  Marshlands*
-  Urban Areas

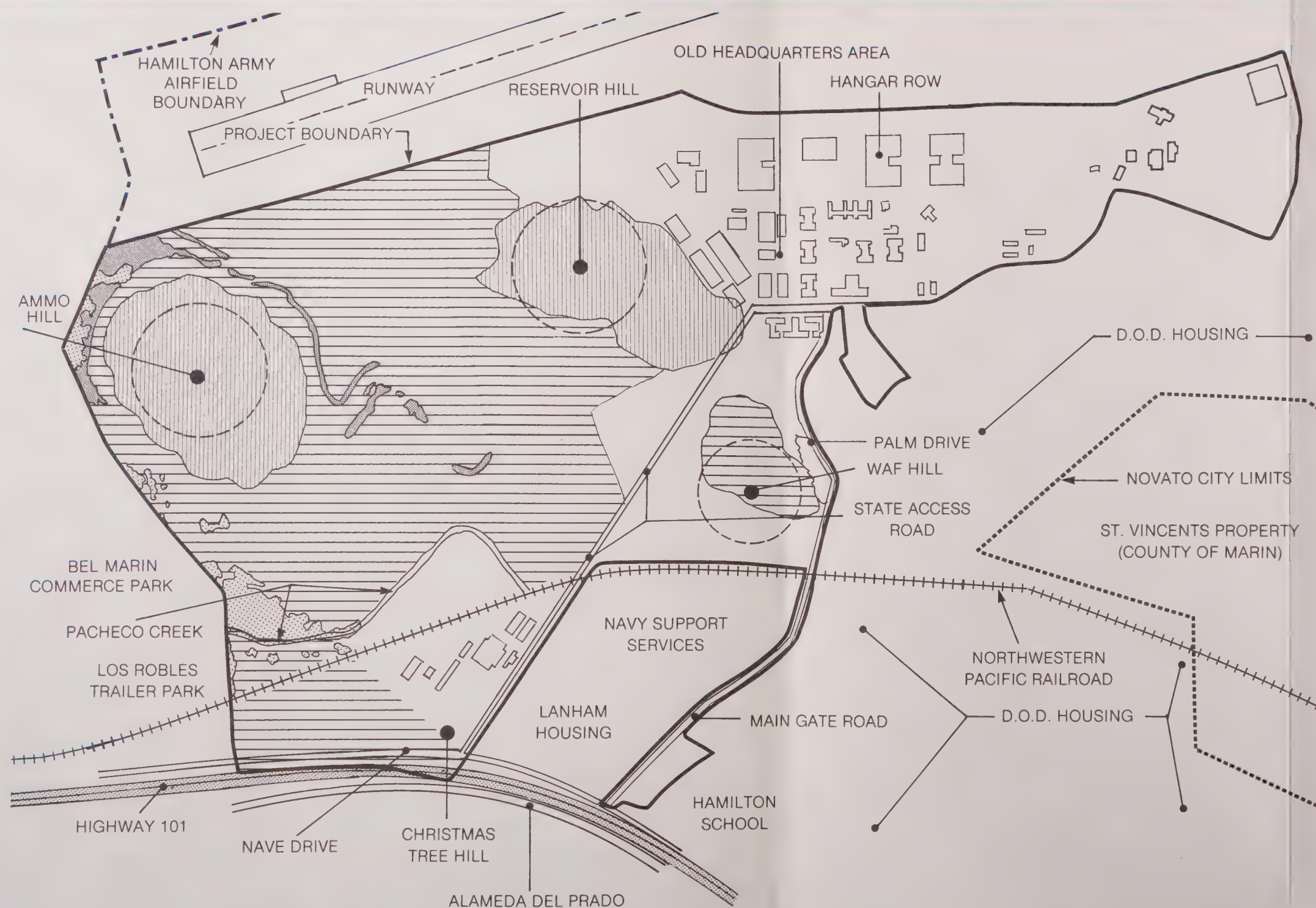
* Includes some buildings, roads and paved areas.

* Please refer to Figure 3-40 for a more detailed map of wetlands.

GENERALIZED VEGETATION



SOURCE: BERG-REVOIR CORPORATION



thistle, wild radish, common mustard and filaree. Past disturbances such as grading, placement of land fill, grazing and mowing have caused the plant species composition to shift from historic native perennial bunchgrasses toward the faster reproducing and more invasive annual grass species. In the period between the establishment of the Air Base and 1985 the grasslands and associated oak woodland/savannah on Ammo Hill were grazed by livestock. The grassland areas are now periodically mowed to control weeds and reduce potential fire hazards. Parts of these areas also burn periodically, either intentionally through control burns or by accidental wildfire. Approximately 44 acres within the grassland area contain paved access roads, a fuel dump, ready hangars, storage bunkers and other structures and urban facilities.

Typical wildlife of the grasslands include various small rodents, western fence lizard, sparrow hawk, turkey vulture and western meadowlark. It is a valuable community area for many wildlife species. Raptors that nest in nearby areas use these grasslands for hunting. A golden eagle was observed hunting over the grasslands next to the air strip on one of the mid-1986 field surveys. Nesting pairs of golden eagles are known to occur along Big Rock Ridge and on Burdell Mountain. A number of red-tailed hawks, American kestrels and turkey vultures were also observed either flying over the grasslands or perched on nearby trees. Large expanses of open grasslands and agricultural fields extend both north and south of the project site. These areas also serve as hunting areas for raptors and thus there does not appear to be a lack of grassland in the project vicinity at this time.

Oak Woodland/Savannah. The distinction between an oak woodland and an oak savannah is based upon the density of the tree cover. A savannah is characterized by an open tree canopy (less than 50% cover) with grasslands between and beneath the tree canopy. An oak woodland is a closed tree canopy (greater than 50%), but also supports grassland and brush beneath the trees in the filtered sunlight. The three hills on the site principally support oak savannah, except for denser oak woodlands on portions of the north and west facing slopes of Ammo Hill, and to a limited extent, on the east facing slopes of Reservoir Hill. Common and typical tree species within this community include California black oak, coast live oak, California buckeye, valley oak. Common brush species within the Oak Woodland community include poison oak, coyote brush and toyon. It appears that the majority of the oak trees are mature. Oak seedlings were not observed during the field survey.

Although the oak woodland/savannah communities are limited to the slopes of the hills on the site, these communities are relatively common and extensive in eastern Marin County, on the east facing slopes of Big Rock Ridge and other hillsides west of the site.

Wildlife observed and expected in these communities include those species listed for the grassland as well as other species which usually require a denser cover of shrubs and trees. These include gray fox, black-tailed jackrabbit, black-tailed deer, ground squirrel, striped skunk, spotted skunk, deer mouse, western toad, western garter snake, racer, gopher snake, western rattlesnake, as well as about 30 additional species of birds. Many of the birds depend upon the trees and shrubs for food, resting perches and nesting sites. The increased availability of cover, vertical stratification of the environment, and additional plant diversity of the woodland component gives the sparse woodland higher wildlife value and higher overall biological richness when compared with the grassland.

Livestock and deer grazing have been implicated in the reduction of oak regeneration in California. Deer and cattle both prefer oak acorns and seedlings and even compete for these food items.³ The lack of oak seedlings on the site would suggest that cattle grazing and heavy deer browsing, as evidenced by the distinct browse lines on both preferred and poor browse plants, are adversely affecting oak regeneration on the site. However, other studies have indicated that poor oak regeneration may not be directly related to cattle and deer grazing. Acorn production by oaks is known to vary a great deal from year to year and, in fact, show signs of a cyclic pattern.

Freshwater/Brackish Marshland. There are a number of wetlands in the Ammo Hill area as indicated on Figure 3.2.3-2, Wetlands. These wetlands include riparian woodlands (see discussion below on riparian) and marshlands. The determination of "wetland" was made by the U.S. Army Corps of Engineers in February 1986, and was based upon vegetation, hydrologic and soil characteristics of the area (see Technical Background Document E, U.S. Army Corps of Engineers, 404 Jurisdictional Determination). The Corps determined that 23.62 acres of wetlands (including riparian woodlands) occur on the site, and fall within 404 jurisdiction. The findings of the Corps' analysis closely correspond to the findings of an independent analysis conducted by the project sponsor's consultants in the fall (October and September) of 1985. Three vegetation types or floristic associations were identified as wetland indicators on the site; (1) willow trees commonly associated

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FIGURE 3.2.3-2

Section 404 Jurisdiction
(Wetlands)

Site Inventory (Approx. acreage)

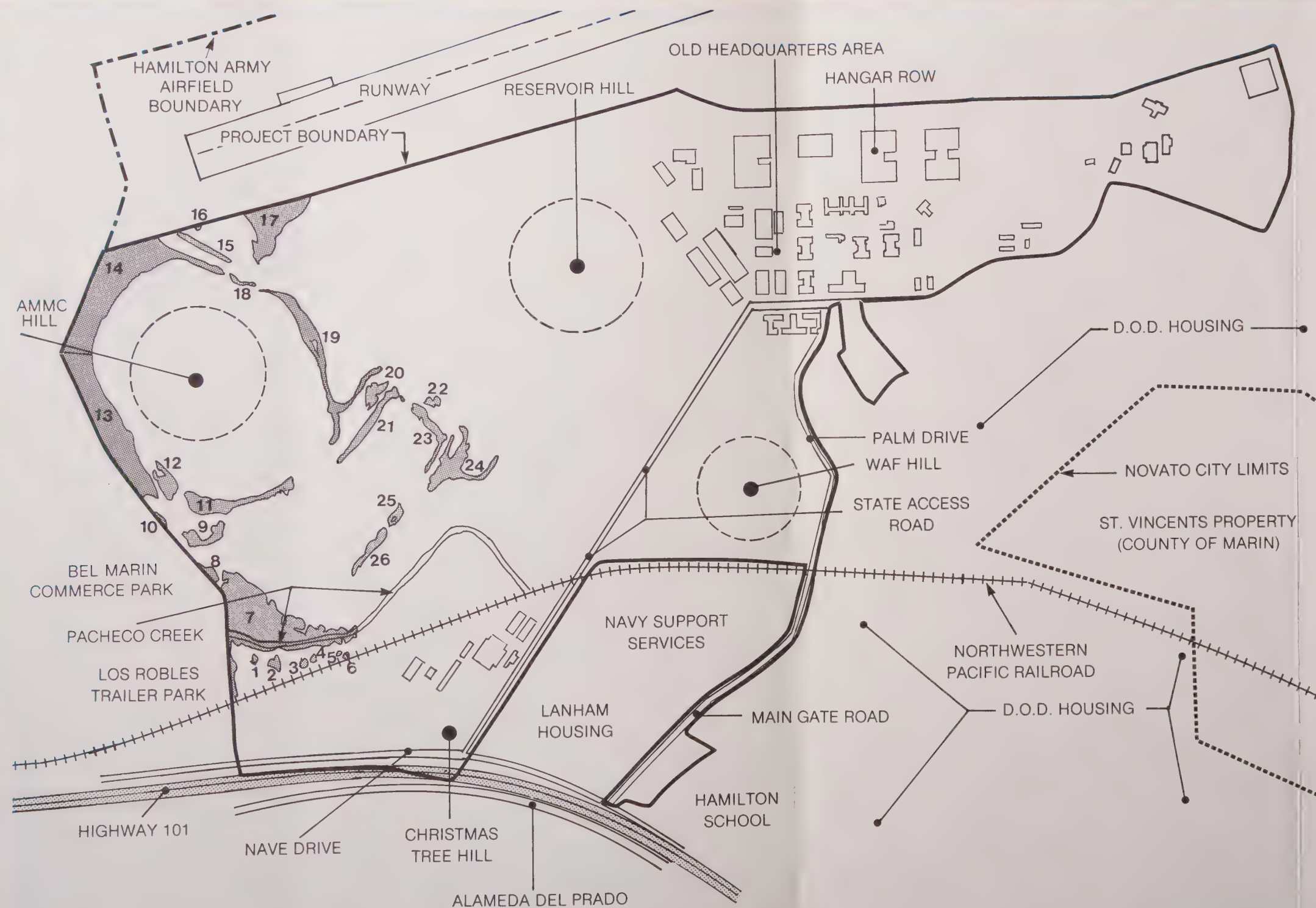
1	.064	14	5.168
2	.11	15	.36
3	.046	16	.018
4	.032	17	1.70
5	.018	18	.11
6	.038	19	1.48
7	5.40	20	.34
8	.172	21	.64
9	.44	22	.09
10	.064	23	.45
11	1.13	24	1.10
12	.42	25	.11
13	3.80	26	.32

TOTAL 23.62

WETLANDS



SOURCE: USCOE



with the riparian woodland community, (2) cattails typically concentrated along the edges of the larger marsh areas and in the bottoms of the creek and drainage ditches, and (3) a grass/forb community which forms a seasonal wetland type. Plant species characterizing this third wetland type are considered either obligate or facultative-wetland plant species by the U.S. Fish and Wildlife Service,⁴ and include sedges, rushes, cockle bur, pickleweed, alkali heath and saltgrass.

Wildlife diversity associated with these marshlands is expected to be the highest of any habitat on the project site. The diversity of these marshlands, ranging from open grass and forbs to tree woodlands, provide abundant cover, food and breeding habitat for many resident and migratory wildlife species. The water within these marshlands also attracts wildlife from neighboring areas. Common reptile and amphibian species expected to occur in these habitats are common and western garter snakes, California newt, pond turtle, bullfrog and Pacific tree frog. Common mammals residing or expected to use these areas include skunk, muskrat, raccoon, deer and various mouse species. The marshland areas and the associated wetlands off-site are known to support a wide variety and number of bird species. A list of birds observed on and off the site from Ammo Hill is presented in Table 3.2.3-2.

Riparian. Those portions of Pacheco Creek that are not concrete lined support a dense growth of willow trees and blackberry thickets. Portions of this riparian community are within the project boundaries northwest of Ammo Hill.

The riparian community is highly significant because of the diversity of wildlife species it wholly or partially supports. A large number of wildlife species utilize riparian communities for shelter, food, water, and nesting sites. Many of the bird species found in the marshland areas use the riparian areas. Mammal, amphibian and reptile species that commonly inhabit riparian zones, and are expected to occur in the riparian communities on the site, include opossum, pocket gopher, deer, skunk, raccoon, garter snake and various lizards, salamanders and toads.

TABLE 3.2.3-2
BIRD SPECIES LIST SIGHTED FROM AMMO HILL¹

Pied-billed grebe	Chestnut-backed chickadee
Double crested cormorant*	Bushtit
American bittern	Bewick's wren
Great egret	Marsh wren
Snowy egret	Ruby-crowned kinglet
Green-backed heron	American robin
Black-crowned night heron	Wrentit
Mallard	Mockingbird
American coot	Water pipit
Killdeer	Cedar waxwing
Great yellowlegs	Yellow-rumped warbler
Gulls (Various)	
Turkey vulture	Rufous-sided towhee
Black shouldered kite	Brown towhee
Northern Harrier*	Lark sparrow
Sharp-shinned hawk*	Savannah sparrow
Red-shouldered hawk	Fox sparrow
Red-tailed hawk	Song sparrow
American kestrel	Golden-crowned sparrow
Anna's hummingbird	White-crowned sparrow
Belted kingfisher	Dark-eyed junco
Northern Flicker	Red-winged blackbird
Mouring dove	Western meadowlark
Black phoebe	Brewer's blackbird
Violet green swallow	House finch
Cliff swallow	Lesser goldfinch
Barn swallow	American goldfinch
Tree swallow	Great blue heron ²
Scrub jay	Salt marsh yellowthroat
American crow	Ducks (Various)
Golden eagle*	Ruddy duck
Cooper's hawk*	Peregrine falcon
Merlin*	California quail
Ring-billed gull	Downy woodpecker
Western kingbird	Say's phoebe
Rough-winged swallow	Common raven
Plain titmouse	White-breasted nuthatch
Red-breasted nuthatch	Rock wren
Western bluebird	Loggerhead shrike
Hutton's vireo	Wilson's warbler
Rock dove	European starling
Nuttall's woodpecker	

¹Source: Marin Audubon Society Surveys.

²Additional species observed during field surveys

*Species of Special Concern (see text for discussion)

Fisheries

The fishery resource of Pacheco Creek has never been investigated. Rainbow trout, California roach, threespine stickleback and prickly sculpin have been reported from creeks in the area.⁵ Other than this one survey there is very little data on fish resources in Pacheco Creek. Chinook salmon have been reported in the Humane Society Marsh.⁶ It is doubtful these salmon are spawning up Pacheco Creek, but it does indicate that anadromous fish can pass through the flap gates at the confluence of Novato and Arroyo San Jose Creeks. There is a remnant steelhead trout run up Novato Creek. It is unclear whether steelhead run up Pacheco Creek and spawn upstream, where the DFG reports there is good spawning habitat up to one mile west of Highway 101.⁶

A recent (April 5, 1988) reconnaissance-level fisheries investigation was conducted in Pacheco Creek to evaluate fish habitat and to determine whether or not anadromous salmonids are present in the creek between the flood control pond and Raccoon Drive, west of Highway 101 (see Technical Background Document F, Fisheries Survey). The survey resulted in the following findings:

1. No salmonids (anadromous or non-anadromous) and no spawning redds were found;
2. If more water were flowing, there could be good spawning and rearing areas in Pacheco Creek west of Highway 101;
3. Due to the limited water supply, however, it is doubtful that salmonids use Pacheco Creek for spawning or rearing; and
4. The weedy pools, sandy substrate, and relatively cool (55-60° F) water provide excellent habitat conditions for the three-spine stickleback, the only fish collected during the field sampling of Pacheco Creek.⁷

Threatened and Endangered Species

Wildlife and plant species listed in Table 3.2.3-3 are known to occur in the San Pablo Bay region and are classified as either rare, threatened, endangered, or a candidate for designation by either the California Department of Fish and Game or the U.S. Fish and Wildlife Service.

The State of California Department of Fish and Game (CDFG) has two categories of listed species: 1) "endangered" and 2) "threatened" or "rare". Endangered species are of major

TABLE 3.2.3-3
THREATENED, ENDANGERED AND BIOLOGICALLY SENSITIVE SPECIES
WHICH ARE KNOWN TO OCCUR IN THE PROJECT REGION¹

<u>Common Name</u>	<u>Status</u> ²	<u>Habitat Requirements & Other Notes</u>
American Peregrine Falcon	E/E/	This bird has been observed migrating through the area and foraging in riparian and marsh areas. There is no suitable nest habitat on the site.
California Brown Pelican	E/E/	No suitable roosting or foraging habitat occurs on the site. Habitat does occur in the open waters of San Francisco Bay east of the site.
California Clapper Rail	E/E/	No suitable habitat occurs on the site. Habitat occurs in bay marshlands east of the site.
California Least Tern	E/E/	No suitable habitat occurs on the site. Foraging habitat occurs in the surrounding area.
Salt Marsh Harvest Mouse	E/E/	No suitable habitat occurs on the site. Suitable habitat occurs in the Bay marshlands east of the site. See Technical Background Document I.
California Black Rail	T/ /	Preferred habitat is infrequently flooded tidal marshes and freshwater marshes. Habitat on the site is marginal.
Long-Billed Curlew	/C2/	Suitable habitat occurs on the site, however none have been recorded on the site to date.
Salt Marsh Yellowthroat	/C2/	Species occurs on the site and in nearby areas. See Technical Background Document J.
California Red-Legged Frog	/C2/	Suitable habitat occurs on the site. However, the presence of bullfrogs on-site would suggest this native frog no longer occurs on the site.
Western Pond Turtle	/C2/	Occurs on the project site near and along Pacheco Creek.

TABLE 3.2.3-3 Continued

<u>Common Name</u>	<u>Status</u> ²	<u>Habitat Requirements & Other Notes</u>
Tidewater Goby	/C2/	Not seen or expected on the site due to preference for greater salinity.
PLANTS:		
Santa Cruz Tarplant	E/C1/1B	Potential habitat occurs on the site.
Baker's Larkspur	R/C2/1B	Marginal habitat occurs on the site.
Delta Tule Pea	/C2/1B	Suitable habitat does not occur on the site, but does occur in the region.
Soft Birds Beak	R/C1/1B	No suitable habitat present on the site. Found in salt marshes in north side of San Francisco Bay.

¹Source: The California Natural Diversity Data Base (CNDDB). The California Native Plant Society (CNPS). Inventory of rare and endangered vascular plants of California, 1984. L.S.A. Endangered Species of Hamilton Field.

²State/Federal/California Native Plant Society; designations as follows:

State Rare (R), Threatened (T), Endangered (E): California Endangered Species Act of 1971.

Federal Endangered (E), Threatened (T), Candidate (C1-Taxa for which the U.S. Fish and Wildlife Service has information to support listing; C2-Taxa for which the Service requires further study before listing): Federal Endangered Species Act of 1973.

California Native Plant Society, Inventory of Rare and Endangered Vascular Plants of California, 1984.

List 1B - Plants rare and endangered in California and elsewhere.

List 3 - Plants about which more information is needed.

List 4 - Plants of limited distribution (a watch list).

concern indicating a reduction in population numbers with the potential for extinction. Species listed as "threatened" or "rare" are of less concern but indicate declining numbers potentially leading to the "endangered" listing. "Threatened" pertains to wildlife and "rare" refers to plants.

U.S. Fish and Wildlife Service (USFWS) listings include endangered, threatened and candidate species. The status of "endangered" or "threatened" is similar in meaning to the state definitions. Candidate species are divided into two categories. Category 1 is comprised of species for which the USFWS currently has enough biological information showing their vulnerability and threat of survival to propose listing. Category 2 species also indicate vulnerability and threats of survival, however, not enough information has been obtained by the USFWS to warrant listing.

Both of these agencies, as well as the Marin Audubon Society and the California Native Plant Society, were consulted in preparing Table 3.2.3-3: Threatened, Endangered and Biologically Sensitive Species.

Six of the bird species listed in Table 3.2.3-2 are recognized as Species of Special Concern (SSC) by the California Department of Fish and Game, a list of bird species with declining populations.⁶ None of these birds have special legal status as SSC thus there are no special requirements to consider potential adverse impacts of a project upon these species. The purpose of this list is to help land managers take action whenever possible to protect the breeding habitats of these birds before they become endangered. None of the SSC sighted in the project area are known to nest there; the likelihood is that they were sighted during their migration movements and/or foraging in the area.

IMPACTS

PROPOSED PROJECT

The proposed project would result in a number of impacts to the biotic resources on the site ranging from the reduction of habitat areas to direct conflicts with various wildlife species. Some of these impacts would be significant and thus require mitigation, while other project impacts would represent an insignificant, incremental effect upon the biotic resources in the area. Some elements of the proposed project may actually enhance certain elements of the biotic resources on the site. Each impact is identified and discussed below.

Habitat Conversion

The proposed project would convert approximately 74% (168.5 acres) of the native or naturalized habitats on the site to an urban setting. Nearly all of the annual grasslands (approximately 131.5 acres) except for those areas within the wetland buffer zones, and approximately 50% of the oak woodland/savannah (37 acres) would be significantly altered by housing and other forms of development. About 30% (7.19 acres) of existing riparian and marshland habitat would be filled and converted to urban habitat. Approximately 5.73 acres of seasonal wetlands south and southwest of Ammo Hill, and at the east end of the main ammunition storage bunker, would be filled for housing development. An additional 1.5 acres of riparian wetlands along Pacheco Creek would be removed in connection with the construction of the New Main Access Road. An equivalent acreage of riparian and marshland habitat is proposed to be developed on the site to offset this loss. As a result, there would be no net loss of riparian and marshland habitat.

The proposed alignment of McInnis Parkway near the north end of the runway, as shown in the Master Plan Application to the City of Novato, has been changed in the revised Land Use Plan (see Figure 2-3) to avoid both existing seasonal wetlands and a portion of the proposed wetlands mitigation area. This revised alignment of McInnis Parkway therefore should not disturb any existing wetlands or the wetlands mitigation area.

The existing portion of Pacheco Creek that flows in a concrete-lined channel (approximately 1,600 linear feet) would be relocated in an underground pipe along the west side of the N.W.P. railroad right-of-way, to a point near the New Main Access Road. This portion of Pacheco Creek has not been properly maintained and, as a consequence, cattails have become established on the sediment deposited in the channel. At the present time this concrete channel provides limited and marginal wildlife habitat. Various alternatives have been examined by the project sponsor in an effort to maintain a surface channel, rather than an underground pipe, in this area; however due to a number of design problems, a surface channel in this area was not believed to be practical.

Two open space areas, comprised of 60 acres (about 26% of the native habitation on the site), would be located at the north end of the site around Ammo Hill, along Pacheco Creek, and on the top of Reservoir Hill. Most of the existing vegetation within the open space area, including the marshlands, oak woodland/savannah, grassland and riparian

woodland, would remain, except for some recreational facilities located on Reservoir Hill and Ammo Hill, and a bicycle/pedestrian path located along the wetlands and the north side of Ammo Hill.

Wildlife

Although the conversion and loss of the grassland and portions of the oak woodland/savannah communities would not constitute a regionally significant loss of limited or important native communities, nevertheless this extensive amount of habitat loss and alteration would have a significant effect upon wildlife on the site.

Wildlife species now residing or utilizing the grassland and oak woodland/savannah would be forced to leave the site due to a lack of appropriate habitat to support them. The greatest impacts would be on black-tailed deer and birds of prey such as red-tailed hawk, golden eagle and Cooper's hawk. The birds of prey would have to extend their ranges and spend more time utilizing the surrounding open spaces to the northeast and south of the site. Hawks that extend into new territory generally compete with other birds for steadily diminishing foraging and nesting areas.

The extensive deer herd now occurring on the site would be displaced and would have to move to surrounding open spaces. Some of the deer may initially move towards the airstrip and baylands as they currently do; however they would not be expected to stay in these areas year-round because the open grasslands and agricultural fields in these areas do not provide enough cover.¹⁰ If too many deer move out into the runway areas and create conflicts with aircraft operations, it may be necessary for the military to secure a depredation permit from the Department of Fish and Game to remove the animals. Eventually, most of the herd may migrate to the west and south of the project site toward Big Rock Ridge. Animals may therefore attempt to cross Highway 101. Most of the deer may successfully negotiate the crossing via overpasses or box culverts, but some may wander out on the highway and be struck by cars. The net result of project development may therefore be the elimination, or at least a limitation, of the deer population on the site. This, however, is not considered to be a regionally significant impact in that the deer numbers in Marin County are high, and losses to this herd would not threaten deer populations in the entire County.¹⁰

The proposed project would preserve the small seasonal pond, at the base of Ammo Hill, used by the Western pond turtle. These turtles have also been observed along Pacheco Creek when the pond dries up. The project may reduce habitat for the long-billed curlew on-site. Habitat now used by the salt marsh yellow throat however would be retained as open space in the project. All three species are Federal Candidate category #2 (see Table 3.2.3-3: Threatened, Endangered and Biologically Sensitive Species).

The proposed project would significantly increase human use and influences on the project site, which could adversely affect the wildlife in the adjacent areas unless carefully controlled. The proposed project has incorporated elements to minimize these impacts, such as fencing of the wetland areas and establishing buffer areas. These measures would help reduce potential indirect human-related impacts; however, these impacts cannot reasonably be eliminated. Greater reduction in impacts can be achieved if larger buffer areas were used, and if the open space areas were closed to public access. There is essentially no practical way of excluding people from open space areas, which have qualities which are naturally attractive to people, such as hill tops and wooded areas. In such cases, unauthorized access and uses may result in greater habitat degradation than if access were controlled. However, the largest practical buffer area would help to further minimize these impacts, as would additional measures noted in the mitigation section to follow.

The proposed creek alterations will not impact suitable spawning habitat for fish, since the only portions of the creek channel that would be altered are currently concrete-lined. A short stretch (approximately 300 linear feet) of the existing earth-lined channel, just below the concrete channel, would also be affected. Impacts to the fisheries resources of Novato Creek are therefore expected to be minimal. Any sediment produced by project construction in the creek would be, to a large extent, controlled on-site or deposited in the intervening flood control pond downstream. The only potentially significant impact to the fisheries resources in Pacheco Creek, would be the placement of a portion of Pacheco Creek underground in culverts. This could adversely affect fish passage upstream, if flow velocities are too high compared to flow velocity between resting pools, and if the low flow volumes are too low in a given stretch of creek.⁹

Wetlands

The proposed project would result in the filling and development of several isolated wetland areas and a small area of riparian vegetation. The proposed filling and development of wetlands is a significant adverse impact. These habitats are located primarily to the south and southwest of Ammo Hill, and at the east end of the main ammunition storage bunker. The proposed development would eliminate approximately 7.19 acres of various wetland types as noted above, including 1.5 acres of riparian woodland habitat and 5.73 acres of herbaceous marshland types. The importance and significance of wetlands are well documented and recognized by various state and federal resource agencies. The proposed action of filling portions of the wetlands on the project site is under the jurisdiction of the Army Corps of Engineers under Section 404 of the Clean Water Act (1977). The Corps of Engineers is required to consult with the U.S. Fish and Wildlife Service, Environmental Protection Agency, and California Department of Fish and Game in carrying out its discretionary authority under Section 404. In addition to their review role over the proposed filling of wetlands, the Department of Fish and Game has review authority for all proposed actions within the banks of Pacheco Creek on the site under sections 1601-03 of the Fish and Game Code.

The Environmental Protection Agency 404 (b)(1) guidelines and Corps regulations require that an alternative analysis be conducted as part of the 404 permit application. The conclusion of the analysis must be that there are no "practicable alternatives" to the proposed filling before a permit may be granted. In other words, the first step in securing a 404 permit is to analyze alternatives that would avoid filling the wetlands. Project sponsors have prepared an Alternatives Analysis and submitted it to the Corps as part of their permit application.

If project sponsors are able to demonstrate that proposed filling of wetlands is necessary and there are no practicable alternatives to this filling, then the project mitigation plan will be evaluated by the Fish and Wildlife Service in relation to mitigation policies of the Service. Briefly, the Service's policy identifies four different resource categories with criteria and mitigation goals for each. The local Fish and Wildlife Service office will review the resources on the site and assign a category to each. Excluding Category 1, which has a goal of "no loss of existing habitat value" or avoidance, the remaining categories range in mitigation goals of "no net loss of in-kind habitat values" (Category 2)

to "minimize loss of habitat values" (Category 4). A basic element of each mitigation goal is an evaluation of "habitat values". Because of the significance of these wetlands, the project sponsors have developed a mitigation plan to address project impacts to the wetlands on the site (see Technical Background Document K, Wetlands Mitigation Plan for details). The proposed wetlands mitigation plan was developed as a result of numerous meetings with CDFG, USFWS, and the Audubon Society, and in response to the Draft EIR on the original Master Plan.

The wetlands mitigation plan proposes to compensate for the loss of approximately 7 acres of wetland habitat by creating nearly 8 acres of similar riparian and seasonal wetlands in the lowlands around Ammo Hill and Pacheco Creek. The stated goals of the plan are to result in no net loss of wetland areas and to increase the habitat values of the wetlands on-site. The plan was separated into two major sections, a seasonal wetlands establishment plan and a riparian establishment plan.

The seasonal wetlands mitigation element of the plan proposes to establish seasonal wetlands at three sites located in the low-lying area to the northwest and east of Ammo Hill and in the area between the NWP railroad right-of-way and Pacheco Creek. The proposed wetland restoration area east of Ammo Hill contains approximately 1.7 acres of seasonal wetland and the intent of the plan is to reestablish a comparatively larger seasonal wetland (5.6 acres) in the area. The additional wetland area would be created by removing existing upland grassland and lowering the elevation in this area. The soils in this area are a combination of seasonally flooded bay mud, and bay mud which supports annual grassland, and fill overlaying bay mud.

A second wetland restoration area is proposed on the northwest portion of Ammo Hill, adjacent to Pacheco Creek and the Humane Society Marsh. The upland grassland areas would be converted to seasonal wetlands by lowering it to the elevation of the existing wetlands in the immediate vicinity.

The third wetland restoration site, proposed between Pacheco Creek and the railroad right-of-way, would involve the conversion of approximately one acre of existing upland grassland in this area. This plan would involve the restoration of approximately 6 acres of seasonal wetlands, resulting in a net increase of 0.4 acres of herbaceous wetlands on the site. Essentially this plan represents a replacement acreage of 1 for 1.

Additional elements of the wetland mitigation plan include buffer and setback areas and a water management proposal. The wetland restoration sites northeast of Ammo Hill and between the railroad right-of-way and Pacheco Creek have been located to make use of existing buffer areas. The restoration area on the northwest side of Ammo Hill would have a designed buffer zone along the east side of this area where project development is proposed. This natural buffer area would vary in width between 10-30 feet and have an elevation difference of approximately 4 feet to the top of a fill bank. The buffer area would be planted with upland grasses and native brush species such as blackberry which would act as an access deterrent. A 4-foot high vinyl coated chain link fence planted with native California rose would be placed at the edge of the buffer adjacent to the setback area described below.

Beyond the buffer area there is a "setback" area varying in width from 10-30 feet from the edge of the buffer strip to a building wall or patio structure. The setback area would contain an 8 foot wide paved pathway on an elevated berm above the wetlands and developed areas. Landscaping within the setback area would be maintained by the building owners or the property owners association.

In effect, the buffer and setback area on the northwest side of Ammo Hill would vary in width from a minimum of 20 feet to a maximum of 60 feet. A 20 foot area separating development features and the wetlands, however, may not adequately reduce the effects of human activities on the wildlife using these areas. A 50-60 foot separation would be much more effective. The California Department of Fish and Game typically requires a 100-foot buffer measured outward from the creek bank for development in riparian corridors.

The project sponsor proposes to establish riparian vegetation along a new channel of Pacheco Creek and along the west bank of the existing Pacheco Creek channel. The goal of this plan is to establish a more diverse riparian vegetation with a canopy of trees which shade the stream, thereby lowering the water temperature, which would increase its biologic value, and shading the waterway, which would limit vegetation growth in the channel and thus reduce necessary clearing for flood control maintenance. This approach will require periodic maintenance in the short-term (10-15 years) to clear cattail and arroyo willow from the channel. As the canopy of trees closes over the stream the cattail

and arroyo willow will be shaded out, reducing the need to clear vegetation from the channel bottom. The closed tree canopy will also result in less algae growth in the stream channel.

Additional design elements of this plan include the following:

- o A buffer and setback area similar to that described for the wetland mitigation area on the east side of Pacheco Creek.
- o The new creek channel would have a low flow and bare flow channel with banks of 3:1 slope.
- o Supplemental irrigation for some planted species for 1 to 2 years.
- o A planting design using a diversity of species and plant growth rates, reflecting natural lateral and vertical zonations for habitat diversity.
- o Rip-rapping or "other similar methods" of channel protection where bank erosion is likely.

Project sponsors, in coordination with the U.S. Fish and Wildlife Service and the California Department of Fish and Game, prepared an evaluation of the impacts of the project on wildlife habitat values. The Habitat Evaluation Procedures (HEP) study was designed to: 1) estimate the project related losses in habitat value of riparian woodland and herbaceous wetland habitats, and 2) estimate the acreage necessary to replace these habitat values on an in-kind basis. The HEP analysis found that there will be a net gain in habitat values as a result of implementing the proposed mitigation plan and there is a half-acre increase in the amount of habitat acreage (see Technical Background Document G, Habitat Evaluation Procedures (HEP)).

Water, Pollution, Bird/Aircraft Conflicts

The proposed project is not expected to have any significant impacts on the nutrient levels of the waters of the Ignacio flood control pond or Humane Society marsh (see Section 3.2.2, Hydrology and Water Quality). The majority of stormwater runoff would be directed into the water drainage system that is pumped into the Bay. None of the wetland mitigation areas are planned as ponding areas for urban runoff. A storm drainage system with catch basins and/or settlement system would be installed. Details of this system have not been developed to date.

Although the proposed development would increase stormwater runoff, nutrients in the waterways are not expected to significantly exceed current levels. Stormwater runoff from the site would be expected to carry pollutants, such as petroleum products, oils and heavy metals (see Section 3.2.2, Hydrology and Water Quality). A small portion of these pollutants would enter the drainage channels, Pacheco Creek, the Humane Society marsh, the Ignacio pond, and Novato Creek. The quantity of these pollutants during the early wet season would be greater than the rest of the year. Heavy fractions of petroleum and heavy metals such as lead and mercury often persist in sediments for a long period of time, and are ingested by mud-dwelling organisms. The release of toxins into a marsh can have important consequences because marshes are prime nursery areas of aquatic wildlife. Eggs, larvae and juveniles of nearly all aquatic invertebrate and vertebrate species have been shown to be very sensitive to the effects of pollutants, while adults of the same species may not be adversely affected.

It is doubtful that any level of oil washed into the water from an industrial operation at the site would be enough to coat or damage the feathers of many birds. However, chronic, low-level releases of hydrocarbons or other compounds which enter the food chain may have toxic effects on resident shorebirds and marsh birds, depending on the quantities of release and/or methods of mitigation implemented to control such releases (see Section 3.2.2, Hydrology and Water Quality).

The proposed industrial and research land uses could involve the use of large amounts of toxic materials. Accidental spills of these large amounts of toxics is thus a possibility. Depending upon the toxic material and the size of the spill, this could jeopardize the surrounding wetlands and associated wildlife.

The proposed consolidated wetland at the base of Ammo Hill may focus bird life activity in this area, especially during the rainy winter months. Egrets, herons, waterfowl, and shorebirds are expected to be the most common and abundant bird species to use this area during the winter migration season. In surveys of bird/aircraft collisions in eight different nations, wading and shorebirds were the second most frequent bird species struck by aircraft; collisions with cranes and herons were much lower in frequency.¹¹

Bird collision data for Hamilton Field are not available. In the past, seagulls were considered to present the greatest hazard to aircraft.¹² Gulls are reported to roost at Gness Field and to cross the airfield from San Pablo Bay on their way to the Redwood Sanitary Landfill five miles to the north.

The length of the runway at Hamilton Field mitigates much of the potential bird strike hazard for aviation use, since planes may be high enough when they leave the airport to avoid the zone of bird concentration over the existing wetlands north of Ammo Hill. The greatest bird strike hazard is likely to be on or over the runway itself where gulls and other birds may rest. Many airports now use various devices to scare birds off runways and the tower routinely warns pilots when aggregations of birds are in the area. However, although a bird strike risk does exist at Hamilton Field, it is not believed to be serious enough to require any mitigation action.

In 1979 when the issue of bird collisions at Hamilton was considered by the Federal Aviation Administration and U.S. Fish and Wildlife Service, it was concluded that although the existing marshes in proximity to the runway may present a risk to aircraft, this risk was not great enough to warrant the elimination of the marshes. A "status quo" condition was favored. It is doubtful that the proposed larger wetland would significantly increase bird life in the runway area and thus would not significantly increase the risk of bird strikes.

ALTERNATIVE 1: DECREASED HOUSING, INCREASED JOBS

This alternative would result in essentially the same impacts as the proposed project. There would be no change in the open space acreages and the land uses adjacent to the proposed wetland mitigation areas would not change. There would be no change in residential and non-residential densities and thus land use areas would be very similar to the proposed project.

ALTERNATIVE 2: DECREASED HOUSING, DECREASED JOBS

This alternative would result in similar impacts as the proposed project. The land use areas would remain the same around the wetland mitigation sites; however the housing areas would likely be less dense. The reduced density of housing may provide opportuni-

ties to expand the wetland buffer areas thereby reducing expected indirect impacts in these areas compared to the proposed project.

The reduction in industrial and warehouse land uses would reduce the potential for an accidental spill of toxic materials. This would be a slight improvement over the proposed project.

ALTERNATIVE 3: INCREASED HOUSING, DECREASED JOBS

Much like Alternatives 1 and 2, this alternative would likely result in similar impacts as the proposed project. The reduction in industrial land uses would lower the potential for an accidental spill of toxic materials even more so than Alternative 2.

The lower density of housing could be designed to maximize the buffer areas around the wetland mitigation area southwest of Ammo Hill. This alternative could reduce some potential impacts to a greater extent than either Alternative 1 or 2.

MITIGATION MEASURES

PROPOSED PROJECT

Proposed Mitigation Measures

Impact mitigation measures proposed by the project sponsors and incorporated into the project development plans are discussed in the following. These include creation of wetland and riparian habitat to compensate for the conversion or loss of equivalent habitat, the establishment of wildlife habitat buffers, and the provision of physical barriers to uncontrolled human and domestic animal access to restored wetlands habitat.

A. Compensation for Loss of Habitat

- o As discussed in the previous section of this EIR, a Wetlands Mitigation Plan has been developed by the project sponsor. The goal of the implementation of this plan is to compensate for the loss of 7.19 acres of seasonal wetlands with 7.62 acres of new wetland and riparian habitat. The Mitigation Plan will result in a net increase of 0.43 acres of seasonal wetland and riparian habitat.
- o For the revegetation of all wetland and riparian restoration areas, native plant species are proposed in the Wetlands Mitigation Plan.

- o The project sponsor has proposed to begin the wetland mitigation work during Phase I of the Hamilton Field Master Plan. Prior to, or at the submission of improvement plans for Phase I, precise improvement plans and hydrologic studies for the Wetlands Mitigation Plan will be submitted to the City of Novato.

B. Establishment of a Wildlife Habitat Buffer Zone

- o The Wetland Mitigation Plan proposes to separate development sites from the wetlands areas by a landscaped buffer, pedestrian corridor, and development setback corridor. The pedestrian path and associated open space corridor will provide a 20-to 50-foot combination buffer and development set back from the edge of the wetlands areas. Approximately 50%-60% of the wetlands habitat frontage will be within 20 to 50 feet of proposed development.
- o The combination pedestrian landscape corridor and development setback buffer between the north slope of Ammo Hill and the wetland will range from 50 feet to approximately 1,000 feet for a frontage distance of approximately 1,200 feet. Approximately 40%-50% of the wetlands habitat frontage will be within 50 to 1,000 feet of proposed development.

C. Restriction of Uncontrolled Human and Domestic Animal Access

- o The Wetlands Mitigation Plan proposes to locate a 4-foot high, vinyl-clad, chain-link fence at the boundary between the wetland buffer and building setback to restrict human and pet access to the wetlands. A fencing plan will incorporate the use of native plant species in plantings adjacent to the fencing.
- o The Wetland Mitigation Plan proposes a pedestrian pathway elevated 2 to 6 feet above the wetlands. No observation decks or walkways into the wetlands are proposed.
- o No single-family patios or rear yards will be allowed adjacent to the wetlands buffer area.
- o Pets will not be permitted by a provision in the lease or sales agreements, or provision in the Property Owners Association CC&R's in rental housing units adjacent to the wetlands setback.

Other Mitigation Measures

Other mitigation provided to minimize the potential significant impacts of the proposed project on biotic resources include recommendations for the additional study of specific project design features and/or the need for more study to address issues to be resolved during the permitting process. Some issues will need to be resolved with state and federal agencies germane to their area of jurisdiction during the permitting process.

Significant impacts identified above and to be addressed below include the filling in of wetland habitats, modification of portions of Pacheco Creek, and the potential increased pollutant loads in the surrounding waterways.

Construction of the New Main Access Road and mitigation for the wetlands lost during construction is proposed in Phase One of the project development schedule. Since it is expected to take years for the vegetation along the new section of Pacheco Creek to develop to a stage that replaces the habitat values lost, there would be an initial net reduction of wetland habitat values on the site. Over time this may balance out since the expected habitat values of the mitigation area are expected to be higher than the existing or projected habitat values if the creek were left alone. The remaining wetland mitigation areas would not be completed until Phase Three.

Given the fact that the science of wetland restoration is in its infancy and that past efforts have resulted in both successes and failures, some reasonable assurances should be factored into the mitigation plan so that the Plan's stated goals are achieved. One way could be to schedule implementation of the mitigation efforts prior to the complete loss of habitat values on the site. In this case all the mitigation efforts should be initiated in Phase One of the proposed construction schedule. The mitigation plan should be developed in enough detail with supporting evidence to reasonably assume the mitigation will be successful or the mitigation area should be expanded. Any expansion of the mitigation area should be located immediately adjacent to the proposed mitigation areas in the ready hangar area and south of Ammo Hill.

In addition to phasing project development to avoid the loss of wetland areas until the proposed mitigation habitats are in place, there should be a detailed monitoring effort during the initial stages of habitat development so that an evaluation can be made as to the relative success or failure of the mitigation efforts. A detailed habitat monitoring plan should be developed and included as part of the mitigation plan.

The final mitigation plan should identify a given agency or group that would be responsible for the maintenance and care of the mitigation areas. The proposed buffer should be expanded to include a minimum distance of four feet where no fill would be allowed so as to prevent any accidental filling of the wetlands.

Before project construction can proceed, a finalized mitigation plan acceptable to the COE, USFWS, and DFG will have to be prepared.

The more detailed mitigation plan should further refine and expand the consideration given to hydraulic factors in proposed mitigation areas, to assure that the planned habitat would likely persist and that the planned changes would not adversely effect remaining wetland areas or create undesirable habitats. The Marin/Sonoma Mosquito Abatement District and the San Francisco Bay Regional Water Quality Control Board should be consulted prior to the final design phase of the wetland mitigation plan. Nearly all of the detailed limitations of the proposed mitigation plan may be addressed during the 404 permit process.

To minimize pollutants and silts entering the waterways, an erosion and pollution control plan should be developed, approved and implemented for construction and post construction periods. The plan should be prepared by the project sponsors in consultation with the Department of Fish and Game, County of Marin Flood Control District, the San Francisco Bay Regional Water Quality Control Board and the City of Novato. Suggested erosion and pollution control mitigation measures are as follows (see also Section 3.2.2, Hydrology and Water Quality for additional details):

- o During construction, provide siltation basins to prevent silt from entering the existing waterways.
- o In landscape plantings, utilize native plant materials that require a minimum of irrigation wherever possible. A licensed Landscape Architect should be consulted for this purpose.
- o Utilize native plant materials or plants that are known to be disease resistant in landscape plantings in the effort to minimize the use of pesticides.
- o Emphasize landscaping methods that minimize the need for herbicides for weed control such as mulching and hydroseeding of potential erosion areas.
- o Pollution control division such as sediment traps should be installed in parking areas, and these areas should be regularly cleaned, especially prior to the rainy season.
- o Hazardous materials should not be stored in a manner which might allow surface drainage into wetlands.

Other mitigation measures that would minimize adverse biotic impacts include:

- o Locate structures on a site-by-site basis to avoid the removal of existing large trees.
- o Utilize tree preservation measures during site construction to minimize the impacts on existing vegetation (see Technical Background Document H, Tree Preservation Methodology).
- o Omit lot line fencing in oak woodland areas that otherwise would inhibit the movement of wildlife.
- o Move any chain link fencing out of the wetland buffer area to allow the use of the buffer areas by all wildlife species.
- o The portion of Pacheco Creek that is to be placed underground should be designed to avoid hindering the passage of fish upstream. The California Department of Fish and Game will have to be consulted during the design phase as part of the Section 1601-03 consultation process.
- o The possession of household pets in the housing areas next to the wetland mitigation areas should be strictly controlled. Dog leash laws should be strictly enforced not only for residents in this area but for all users of the trails as well. Cats should not be allowed to stray in the area. Only cats that are confined indoors should be allowed in the adjacent housing developments.
- o All areas of the creek alignment that would require rip-rap to control erosion should be identified. Every effort should be made to minimize the need for rip-rap protection by selecting alignments that would minimize bank erosion and by using native vegetation as much as possible in stabilizing the banks.

ALTERNATIVE 1: DECREASED HOUSING, INCREASED JOBS

Mitigation measures for this alternative would be essentially identical to those suggested for the proposed project. An additional measure that may be employed for this alternative would be to reduce the housing development area and expand the wetland buffer area south and west of Ammo Hill. This would allow more buffer and/or wetland mitigation area if necessary.

ALTERNATIVE 2: DECREASED HOUSING, DECREASED JOBS

This alternative would result in less expected impacts than the proposed project and require less but similar mitigation measures. More buffer or wetland mitigation area could be made available in both the housing and industrial development areas around Ammo Hill.

ALTERNATIVE 3: INCREASED HOUSING, DECREASED JOBS

This alternative would result in similar impacts as the proposed project, except that the decrease in industrial land uses would be used to expand the wetland mitigation area east of Ammo Hill rather than increase the housing area, and thus keep the housing density closer to what is being proposed by the preferred project. There may be opportunities to increase the wetland buffer/mitigation areas south and west of Ammo Hill by increasing the housing density elsewhere on the site.

¹ Draft Environmental Impact Report on the Novato General Plan, Volume 1, July 1, 1981.

² Ecotone: Areas where different biotic communities overlap or meet.

³ D.S. Pine and T.M. Mansfield. 1980. Competition Between Deer and Livestock in Central Coastal California. California Department of Fish and Game. 8 pp.

⁴ Obligate: A plant species that is generally found only in wetlands under natural conditions.

Facultative: A plant species that usually is found in wetlands, but may occasionally be found in non-wetlands under natural conditions.

⁵ Leidy, R.A. 1984. Distribution and Ecology of Stream Fishes in the San Francisco Bay Drainage. Hilgardia Vol. 52, No. 8.

⁶ Cox, Bill. Fisheries Biologist California Department of Fish and Game, personal communication, February 25, 1988.

⁷ A. A. Rich and Associates. 1988. A Qualitative Fisheries Survey of Pacheco Creek, Novato, California. Report prepared for and submitted to EIP Associates.

⁸ Remsen, J.V. Bird Species of Special Concern in California, 1978.

⁹ Cox, Bill, op. cit.

¹⁰ Lt. Frank Russell, Game Warden, and Frank Botti, Wildlife Biologist, Department of Fish and Game, personal communication, June 6, 1986.

¹¹ Blokpoel, H., Bird Hazards to Aircraft: Problems and Prevention of Bird/Aircraft Collisions, Clark-Irwin and Co., 1976.

- ¹²Cogswell, Harold T., "The Hazard of Gulls to Aircraft in a Bayside Complex of Airports and Solid Waste Sites," in Proceedings Conference on the Biological Aspects on the Bird-Aircraft Collision Problems, Clemson University, 1974.

SUMMARY COMPARISON OF IMPACTS AND MITIGATION MEASURES

3.2.3 VEGETATION AND WILDLIFE

	IMPACT	MITIGATION
PROPOSED PROJECT	<ul style="list-style-type: none"> * Low level releases of toxic compounds into the nearby wetlands from urban runoff and possible large toxic spills. * Habitat conversion-filling of approximately 7 acres of wetlands with plans to re-create approximately 8 acres of wetland habitats. * Reduction of wildlife habitat and deer populations. * Human and domestic animal encroachment into wildlife areas. * Potential blocking of fish migration up Pacheco Creek. 	<ul style="list-style-type: none"> * Require detailed erosion control and toxic spill control plan and install sediment traps around parking lots. Require regular cleaning of paved areas, especially just prior to the rainy season. * Approve proposed wetlands mitigation plan with Master Plan and require submittal of detailed design information prior to project construction. * Wetland re-creation. * Control of human access into areas via trails, fences, & sufficient buffer areas. * Enforce restriction of pets outdoors near wetlands area. * Consult with DFG as part of the 1601-03 permit process on proper design of the realignment of Pacheco Creek.
ALTERNATIVE 1: (Decreased Housing, Increased Jobs)	Same as proposed project.	Same as proposed project. Increase office density and use reduced housing area for greater wetland mitigation areas or buffer areas.
ALTERNATIVE 2: (Decreased Housing, Decreased Jobs)	Similar to the proposed project. With the reduced industrial use the potential for a toxic spill would be slightly less.	Same as the proposed project except reduction of housing and industrial areas rather than decreasing densities in same areas. These new areas can be used to expand the wetland mitigation and / or buffer areas.
ALTERNATIVE 3: (Increased Housing, Decreased Jobs)	Same as Alternative 2 but to a lesser degree.	Same as Alternative 2 but more potential for greater wetland mitigation opportunities.

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3.2.4 AIR QUALITY

SETTING

Climate

The project site lies near the west shore of San Pablo Bay, directly west of the main air flow through the Carquinez Straits, but is sheltered from this flow by high terrain to the west and southwest. Hence wind speeds in the area are usually low. Winds of five miles per hour or less occur about 45% of the time, and follow a prevailing northwest-southeast axis. The southeast wind predominates on summer afternoons, while the northwesterly flow predominates at night. In general, winds are highest in the afternoon and lightest during the night and morning hours. The windiest month is usually May or June; the lightest average winds occur in November or December. The reduction of the sea breeze by the coastal mountains gives the region an entirely different temperature regime from areas west of the mountains. Daily variations in temperature are relatively large; daytime temperatures are higher than those of most Bay Area cities (January and July mean maximum temperatures are 56°F and 80°F, respectively). The frequent clear skies (40% of the days over the course of a year) and light winds of the area enhance radiative cooling at night; thus nighttime temperatures are relatively low (January and July mean minimum temperatures are 36°F and 50°F, respectively), frequently falling below freezing in winter. Mean annual precipitation is 28 inches.

Regulatory Background

The 1970 Clean Air Act gave the U.S. Environmental Protection Agency (EPA) the authority to set federal ambient air quality standards. The Act indicated the need for primary standards to protect public health and secondary standards to protect public welfare from effects such as visibility reduction, soiling, nuisance, and other forms of damage. It also required that the federal standards be designed to protect those people most susceptible to respiratory distress, such as asthmatics, the elderly, very young children, people already weakened by illness, and persons engaged in strenuous work or exercise (all termed "sensitive receptors"). In 1971, the EPA established federal standards for five major criteria¹ air pollutants: photochemical oxidants (ozone), carbon monoxide (CO), suspended particulate matter (originally the standard applied to particulates of any diameter, termed total suspended particulates or TSP, but the standard was recently changed to apply only to particulates less than 10 microns in diameter, termed PM₁₀),

nitrogen dioxide (NO₂), and sulfur dioxide (SO₂). State ambient air quality standards were established in California starting in 1969, pursuant to the Mulford-Carrell Act. The federal and State standards, given in Table 3.2.4-1, provide acceptable durations for specific contaminant levels in order to protect sensitive receptors from adverse effects as indicated in Table 3.2.4-2.

The 1977 Clean Air Act Amendments required that each state identify areas within its borders (i.e., non-attainment areas) that do not meet federal primary standards for criteria pollutants, and further, devise a State Implementation Plan (SIP), subject to EPA approval, to attain federal primary standards no later than 1987. The California standards do not have specific attainment dates.

The California Air Resources Board (CARB) coordinates and oversees both State and federal air pollution control programs in California. As part of this responsibility, the CARB monitors existing air quality, establishes State air quality standards (which in many cases are more stringent than federal standards, as shown in Table 3.2.4-1), limits allowable emissions from vehicular sources, and is responsible for putting together the SIP. The CARB has divided the State into many single and multi-county air basins. Authority for air quality management within them has been given to local Air Quality Management Districts which develop local non-attainment plans within their jurisdiction. The CARB has designated most of the nine-county Bay Area (excluding northern Sonoma and Solano Counties) as the San Francisco Bay Area Air Basin under the jurisdiction of the Bay Area Air Quality Management District (BAAQMD).

In addition to the criteria air pollutants, another group of substances called toxic air pollutants are known to be highly injurious, even in small quantities. These substances number in the hundreds but they are relatively uncommon and ambient air quality standards have not been set for most of them. The EPA and the CARB are studying a number of toxic air pollutants. Table 3.2.4-3 summarizes their status in the review process. To date the emissions of five such pollutants are being regulated by the BAAQMD: asbestos, beryllium, mercury, vinyl chloride, and benzene.

TABLE 3.2.4-1
FEDERAL AND STATE AMBIENT AIR QUALITY STANDARDS

<u>Pollutant</u>	<u>Averaging Time</u>	<u>Federal Primary Standard</u>	<u>Federal Secondary Standard</u>	<u>California Standard</u>
Ozone	1-Hour	0.12 ppm	0.12 ppm	0.10 ppm
Carbon Monoxide	1-Hour	35.0 ppm	35.0 ppm	20.0 ppm
	8-Hour	9.0 ppm	9.0 ppm	9.0 ppm
Nitrogen Dioxide	1-Hour	--	--	0.25 ppm
	Annual	0.05 ppm	0.05 ppm	--
Sulfur Dioxide	1-Hour	--	--	0.5 ppm
	24-Hour	0.14 ppm	--	0.05 ppm
	Annual	0.03 ppm	--	--
Suspended Particulates ¹	24-Hour	150 µg/m ³	150 µg/m ³	50 µg/m ³
	Annual	50 µg/m ³	60 µg/m ³	30 µg/m ³

ppm = parts per million, µg/m³ = micrograms per cubic meter

¹State and federal standards are for particulate material less than 10 microns in diameter, usually designated PM₁₀.

Source: Bay Area Air Quality Management District

TABLE 3.2.4-2
HEALTH EFFECTS SUMMARY OF THE CRITERIA AIR POLLUTANTS

Air Pollutant	Adverse Effects
Ozone	<ul style="list-style-type: none"> - Eye irritation - Respiratory function impairment
Carbon Monoxide	<ul style="list-style-type: none"> - Impairment of oxygen transport in the bloodstream, increase of carboxyhemoglobin - Aggravation of cardiovascular disease - Impairment of central nervous system function - Fatigue, headache, confusion, dizziness - Can be fatal in the case of very high concentrations in enclosed places
Sulfur Dioxide	<ul style="list-style-type: none"> - Aggravation of chronic obstruction lung disease - Increased risk of acute and chronic respiratory illness
Nitrogen Dioxide	<ul style="list-style-type: none"> - Risk of acute and chronic respiratory disease
Total Suspended Particulates	<ul style="list-style-type: none"> - Increased risk of chronic respiratory disease with long exposure - Altered lung function in children - With SO₂, may produce acute illness - Particulate matter, 10 microns or less in size (PM₁₀), may lodge in and/or irritate the lungs

Source: Bay Area Air Quality Management District.

TABLE 3.2.4-3

TOXIC CHEMICALS UNDER STUDY BY THE ENVIRONMENTAL PROTECTION AGENCY
AND THE CALIFORNIA AIR RESOURCES BOARD

<u>EPA Status</u>	<u>CARB Status</u>
Emission Standards Promulgated:	Identified as Toxic Under AB 1807:
Arsenic	Asbestos
Asbestos	Benzene
Benzene	Cadmium
Beryllium	Chromium
Cadmium	Dioxin
Coke Oven Emissions	Ethylene Dichloride
Mercury	Ethylene Dibromide
Radionuclides	
Vinyl Chloride	Substances in the Review Process:
	Arsenic
Intent to List as Hazardous:	Chloroform
Carbon Tetrachloride	Carbon Tetrachloride
Chromium	Ethylene Oxide
Chloroform	Nickel
Ethylene Dibromide	Trichloroethylene
Ethylene Dichloride	Vinyl Chloride
Ethylene Oxide	
Trichloroethylene	Substances Not Yet Under Review:
	1,4-Dioxane
State/Local Referral:	Acetaldehyde
Acrylonitrile	Acrylonitrile
Beryllium	
Detailed Assessment in Progress:	Coke Oven Emissions
Dioxin	Dialkyl Nitrosamines
Formaldehyde	Epichlorohydrin
	Formaldehyde
Decided Not to Regulate:	Lead
Chlorobenzene	Mercury
Chloroprene	Nitrosomorpholine
Chlorofluorocarbon	Polychlorinated Biphenyls
Epichlorohydrin	Radionuclides
Hexachlorocyclopentadiene	
Manganese	Limited Information to Support Review:
Nickel	Allyl Chloride o,m,p-Xylene
Phenol	Acrolein o-,m-,p-Cresol
Toluene	Benzyl Chloride Phenol
Vinylidene Chloride	Chlorobenzene Propylene Oxide
	Manganese Phosgene
	Methyl Bromide p-Dichlorobenzene
	Maleic Anhydride Vinylidene Chloride
	Nitrobenzene
	Hexachlorocyclopentadiene

Source: BAAQMD and South Coast Air Quality Management District.

Air Pollutant Problems and Trends - Bay Area, Marin County, and Project Vicinity

Prior to the advent of this century, air in the Bay Area Air Basin was relatively clean. Particulates entrained by wind or injected by lightning-caused fires, and hydrocarbons emitted from vegetation were the only natural air pollutants. Present air quality problems come as a result of extensive industrial and urban development, especially from the widespread and intensive use of motor vehicles by Basin residents. Topographic and meteorological conditions often reduce the ability of the atmosphere to disperse air pollutants and allow such pollutants to attain relatively high ambient concentrations.

Regionally, the most severe and complex air quality problem is the relatively high level of ambient ozone experienced during warm, meteorologically stable periods in the summer and autumn. Ozone is not emitted directly from pollutant sources, but is formed in the atmosphere through a complex series of photochemical reactions involving reactive organic compounds (ROG) and nitrogen oxides (NO_x). No single source category accounts for a majority of the ROG and NO_x emissions, and the many sources are spread throughout the Bay Area air basin. Although the Bay Area's highest ozone levels can fluctuate from year to year, standards are exceeded most often in the Santa Clara, Livermore, and Diablo valleys. The problem is most severe in Santa Clara County, where ozone levels occasionally have approached the first-stage Health Advisory Level (0.2 parts per million).

In contrast to ozone, CO is a sub-regional problem in the Bay Area, because CO is a non-reactive pollutant with one major source, motor vehicles. Ambient CO distributions closely follow the spatial and temporal distributions of vehicular traffic, and are strongly influenced by meteorological factors such as wind speed and atmospheric stability. The one-hour and eight-hour CO standards are occasionally exceeded in those parts of the Bay Area subject to a combination of high traffic density and susceptibility to the occurrence of surface-based radiation inversions during the winter months (i.e., northern Santa Clara, western Alameda, and southwestern Solano Counties).²

Levels of TSP in the Bay Area typically show a pattern of low values near the coast. They increase with distance inland and reach their highest levels in dry, sheltered valleys, such as the Santa Clara, Diablo, and Livermore Valleys. The federal secondary standard is occasionally exceeded in many Bay Area communities. The most important anthropogenic

sources in the Bay Area are demolition and construction activity, and motor vehicle travel over paved and unpaved roads.

The major sources of NO_x , compounds which have an important role in the formation of ozone, are vehicular, residential, and commercial fuel combustion. Concentrations of NO_2 , the most abundant form of ambient NO_x , are highest in the South Bay, where the standard was last exceeded in 1980 at the San Jose monitoring station. The NO_2 standard has not been exceeded anywhere in the Bay Area since that time.

The burning of high sulfur fuels for activities such as electricity generation, petroleum refining, and shipping are the major sources of ambient SO_2 . The highest levels of SO_2 are recorded by monitoring stations located in a relatively narrow crescent centered on the bayshore of northern Contra Costa County, where the major sources are located. Bay Area seasonal maximums, however, rarely exceed 50% of the standard and SO_2 levels at most Bay Area monitoring stations are less than 10% of the standard. The SO_2 standard is currently being met throughout the Bay Area.

The BAAQMD operates a regional air quality monitoring network in order to gauge the Bay Area's progress toward attainment of federal and State ambient air quality standards. At monitoring stations throughout this network, readings are taken regularly of the five major criteria air pollutants. On the basis of monitoring data from all stations in the Bay Area, the CARB has designated the entire Bay Area as a non-attainment area with respect to the federal ozone and CO standards, and Santa Clara County as a non-attainment area with respect to the federal secondary TSP standard.

A five-year summary of the data collected at the San Rafael station, the only monitor in Marin County, is shown in Table 3.2.4-4. Comparison of the data in Table 3.2.4-4 with readings taken at other BAAQMD monitoring stations reveal that while air quality in San Rafael is generally good, occasional violations of the State ozone standard do occur. While no violations of the CO and particulate standards are shown, concentrations of these pollutants are very sensitive to the presence of strong local sources. Therefore, the absence of measured CO and particulate standard violations in Table 3.2.4-4 should not be taken as proof that neither standard is being exceeded in Marin County. The potential for the future occurrence of high pollution episodes there is great. Factors which govern the

TABLE 3.2.4-4
SAN RAFAEL AIR POLLUTANT SUMMARY 1983-1987

STATION: 534 Fourth Street

<u>Pollutant</u>	<u>Standard</u>	<u>1983</u>	<u>1984</u>	<u>1985</u>	<u>1986</u>	<u>1987</u>
OZONE (ppm ¹)						
Highest 1-hour average	0.12/0.10	0.11	0.11	0.10	0.08	0.10
Days > federal std. (0.12)		0	0	0	0	0
Days ≥ state std. (0.10)		2	5	1	0	1
CARBON MONOXIDE (ppm ¹)						
Highest 1-hour average	35.0/20.0	11.0	14.0	10.0	10.0	NA
Days > federal std. (35.0)		0	0	0	0	NA
Days ≥ state std. (20.0)		0	0	0	0	
Highest 8-hour average	9.0	5.5	5.8	4.6	5.9	4.5
Days ≥ fed/state std.		0	0	0	0	0
NITROGEN DIOXIDE (ppm ¹)						
Highest 1-hour average	0.25	0.10	0.12	0.09	0.11	0.13
Days ≥ state std.		0	0	0	0	0
SULFUR DIOXIDE (ppm ¹)						
Highest 24-hour average	0.05	0.005	0.006	0.010	0.007	0.005
Days ≥ state std.		0	0	0	0	0
SUSPENDED PARTICULATES (ug/m3 ²)						
Highest 24-hour average	150	93	117	102	122	NA
Days > federal std.		0	0	0	0	NA
Annual geometric mean	60	49.4	55.5	54.0	50.2	47.0

¹ ppm: parts per million.

² ug/m3: micrograms per cubic meter.

Source: California Air Quality Data, Annual Summary, California Air Resources Board, 1982-1986.

occurrence of such episodes, such as the high frequency of light winds, frequent occurrence of inversion conditions, plentiful sunshine, and the restriction of horizontal dispersion by mountainous terrain, are all present.

The trends and pollutant levels for San Rafael are generally indicative of conditions on the project site and in its vicinity. However, because the project area is less urbanized than San Rafael pollutant sources are less abundant there. This would lead to lower ambient pollutant levels in cases where proximity to local pollutant sources is the primary determinant of impact magnitude (i.e., especially with CO and, to a lesser extent, TSP).

The BAAQMD has recently established a number of monitors to track ambient levels of eleven potential toxic air pollutants: Perchloroethylene (PERC), Ethylene Dibromide (EDB), Ethylene Dichloride (EDC), Trichloroethylene (TCE), Methyl Chloroform (TCA), Methylene Dichloride, Carbon Tetrachloride, Chloroform, Vinyl Chloride, Benzene, and Toluene. Stations were established at Fort Cronkite and San Rafael in early 1987 but data is not yet available from them. Stations in Contra Costa and Solano Counties have been operating longer and Table 3.2.4-5 gives a summary of their findings.

Air Quality Planning and Control in the Bay Area

Planning for the attainment and maintenance of federal and State air quality standards in the Bay Area is the joint responsibility of the BAAQMD, the Association of Bay Area Governments (ABAG), and the Metropolitan Transportation Commission (MTC). To deal with violations of CO and ozone standards in the region, the BAAQMD, ABAG, and the MTC authored the 1982 Bay Area Air Quality Plan (AQP). The AQP was based on detailed inventories of present and future ROG and CO emissions, which reflected anticipated regional trends in population, employment, energy use, and of existing and proposed emission control regulations. Using the inventories, future regional ozone and local CO levels were modeled. The AQP called for the imposition of additional controls on stationary and mobile sources of ROG and CO, and set forth a schedule for adopting and implementing these controls. The AQP projected attainment of national ambient standards for CO and ozone by 1987 and their maintenance below the standards through the year 2000. The key CO and ozone strategies in the AQP include a motor vehicle inspection/maintenance (I&M) program, which was adopted by the State of California in

TABLE 3.2.4-5
TOXIC AIR POLLUTANT DATA SUMMARY

<u>Pollutant</u>	<u>1985</u>			<u>1986</u>		
	<u>Concord</u>	<u>Richmond</u>	<u>Vallejo</u>	<u>Concord</u>	<u>Richmond</u>	<u>Vallejo</u>
Benzene	1.8	2.2	----	2.5	1.9	2.2
Carbon Tetrachloride	1.5	1.5	----	1.2	1.1	1.0
Chloroform	0.04	0.03	----	0.05	0.07	0.16
Methylene Chloride	0.7	1.0	----	1.4	1.6	1.7
Methyl Chloroform	3.6	0.9	----	0.8	1.3	0.4
Perchloroethylene	0.6	0.5	----	0.5	0.3	0.5
Trichloroethylene	0.4	0.5	----	0.3	0.5	0.2

Data shown are early average concentrations in parts per billion.

Source: BAAQMD, Toxic Air Monitoring, Summary 1985-1987.

1984. No additional control measures were recommended for TSP control. This problem is difficult to control with currently available methods, and the BAAQMD only recommended further research on the problem.

Monitoring data for 1987, recently made available by the BAAQMD, shows that occasional violations of the federal ozone and eight-hour CO standards (i.e., 14 days over the standard for ozone, and 1 day over the standard for CO) are still being measured in the Bay Area. As a result of these measurements, the BAAQMD will not be able to declare regional attainment of the ozone standard, but the Bay Area has technically become an attainment area for CO because one violation per year is allowable under federal guidelines. Official certification of the Bay Area as a CO attainment area will not mean that this air quality problem has been overcome. Weather conditions last winter were not favorable to the formation of inversions which limit the dispersion of CO. The occurrence of more severe inversion conditions in succeeding winters could cause further violations of

the eight-hour CO standard to be recorded at BAAQMD street-level CO monitors in San Francisco and San Jose.

Because of the ozone standard violations, the BAAQMD will have to propose and implement additional ozone control strategies and estimate a new attainment date in order to satisfy the EPA. Otherwise, the federal government could impose a funding moratorium on the construction of highway improvements and major stationary sources of air pollutants.

IMPACTS

PROPOSED PROJECT

Air quality analyses were carried out for two scenarios of future development on the project site. In the first, called the Project scenario, it was assumed that, in addition to cumulative growth expected to occur in Marin County and the Bay Area over the next nine years, a mixed use residential/commercial complex would be developed on the site of Hamilton Field as specified in the Project Description section of this EIR. In this case, vehicles would be the major source of additional air pollutants, but emissions from building energy use and industrial/commercial processes would also contribute to the total. In the second scenario, called the Baseline scenario, the proposed development of Hamilton Field would not occur and only the cumulative growth mentioned above would occur.

Project air quality impacts comprise two categories: temporary impacts due to project construction and long-term impacts due to project operation. Impacts in each category can be classed as having effects on regional or local scales.

Construction Impacts

Regional and Local Effects

Under the Project scenario, construction activities would temporarily increase particulate concentrations in and near the areas of construction. Equipment and vehicles generate dust during clearing, excavation and grading. Construction vehicle traffic on unpaved surfaces also generates dust, as would wind blowing over exposed earth.

It is not possible to estimate accurately the particulate concentrations that would occur at or adjacent to the construction sites because such concentrations are very sensitive to local meteorology and topography and to variations in soil silt and moisture content. However, measurements taken during apartment and shopping center construction in the southwestern United States provide a rough indication of the amount of particulate emissions expected. These measurements indicate that approximately 1.2 tons of dust are emitted per acre per month of construction activity.³ Much of this dust is comprised of large particles (i.e., diameter greater than 10 microns) which settle out rapidly on nearby horizontal surfaces and are easily filtered by human breathing passages. Most of the dust generated by construction is, therefore, of concern more as a soiling nuisance rather than for its unhealthful impacts. The remaining fraction of small particulates (i.e., diameter less than 10 microns, termed PM₁₀) might be sufficient to violate the federal and State 24-hour average PM₁₀ standard particulate standard in the vicinity of construction. Any violations of the PM₁₀ standard would be considered adverse impacts. Unless mitigation measures were implemented, elevated levels of PM₁₀ would remain as long as construction continues.

Construction vehicles/equipment and worker commute vehicles would emit exhaust at the construction sites thereby contributing to the regional pollutant totals. Because vehicle/equipment emissions would be relatively small in comparison to operational emissions, they would not be significant on the regional scale, but spot violations of the CO standards may occur in the vicinity of heavy equipment use. Any violations of the CO standard would be considered significant adverse impacts. Odors of construction equipment exhaust would probably be noticeable in the environs of the project site for the duration of construction.

During the demolition and construction phase of the Project scenario, asbestos emissions could occur when existing buildings are removed or during excavation on WAF hill where the soil has been contaminated unless mitigation measures were implemented (see Section 3.1.8, Hazardous Materials).

Under the Baseline scenario, no new construction would occur on the project site. Consequently, none of the construction-related emissions of air pollutants as mentioned above would occur.

Operational Impacts

Vehicles would be the major source of additional air pollutants resulting from the development of the project site. Emissions from fuel combustion for the heating/cooling of new commercial/industrial structures and from industrial processes would also contribute to the total. Air pollutant emissions from vehicles generated by development of the project area are indicated in Table 3.2.4-6. Emissions from fuel combustion for heating/cooling and industrial processes vary greatly depending on the specific uses planned for the project area. The BAAQMD has developed generalized emission factors for selected industry groups which are included in Technical Background Document G.

Regional Effects

Under the Project scenario, vehicular traffic would generate about 0.39 tons/day of ROG and about 0.68 tons/day of NO_x, while ROG and NO_x emissions from residential energy use were found to be 0.22 tons/day and 0.04 tons/day, respectively. At this stage of project planning, the exact type of industrial/commercial uses have not been decided upon. Therefore, it is impossible to accurately estimate ROG and NO_x emissions from these uses. ROG and NO_x emissions from such uses can be significant. For example, emissions from electronics-related industries, such as semiconductor fabrication, can contain large amounts of ROG, mainly from organic solvents used on photoresist lines and for cleaning. The BAAQMD estimates that ROG and NO_x emissions from this use would amount to 32 lbs./acre/day and 0.3 lbs./acre/day, respectively.⁵ Based on the square footage estimate of project R&D uses (740,000 sq.ft or 17.0 acres), ROG and NO_x emissions under the Project scenario could be as high as 0.27 tons/day and 0.003 tons/day, respectively. In the absence of control measures (such as carbon absorption or catalytic oxidation of solvent vapors), ROG emissions from such operations would be comparable to ROG emissions associated with project vehicular sources.

For projects which generate the majority of their air pollutants from vehicular sources, the BAAQMD has established its significance threshold at 1% of the County emissions.⁴ As shown in Table 3.2.4-6, emissions of ROG and NO_x associated with project vehicular sources would exceed 1% of County emissions and so would be considered adverse additions to the County and Bay Area totals.

TABLE 3.2.4-6
COMPARISON OF PROJECT, COUNTY AND REGIONAL
POLLUTANT EMISSIONS (TONS/DAY)

Pollutant	Project ¹				Regional ²	
	Vehicular Sources		Stationary Sources		County	Bay Area
	Residential	Commercial	Residential	Commercial		
CO	2.565	4.106	0.117	Variable	123.5	2,164
ROG	0.140	0.254	0.223 ³	Variable	15.8	543
NO _x	0.226	0.456	0.040	Variable	13.9	488

¹ Emissions due to vehicular sources were estimated by using the California Air Resources Board (CARB) URBEMIS2 model. An average vehicle speed of 35 mph, and ambient temperatures of 50°F for CO and 75°F for ROG and NO_x were assumed. Emissions due to residential stationary sources were estimated by applying generic emission factors developed by the BAAQMD. The BAAQMD has also developed emission factors for commercial/industrial stationary sources, but they vary greatly depending on the nature of the commercial/industrial activity. See Appendix B for a listing of these emission factors.

² Countywide vehicular emissions were taken from Base Year 1983 Emissions Inventory Summary Report, BAAQMD, August 1987. The Bay Area totals given here are BAAQMD estimates for the year 1990, taken from Air Quality and Urban Development, Table VI-A-2.

³ Includes an unknown proportion of hydrocarbon emissions from natural gas combustion. Such hydrocarbons are not photochemically active.

Under the Baseline scenario, no additional emissions of ROG and NO_x would result, hence there would be no significant effect on regional ozone levels.

Local Effects

Future background CO concentrations would be affected by changes in areawide vehicular travel and by the amount of CO emitted by the average vehicle. The BAAQMD publication Air Quality and Urban Development contains contour maps of the Bay Area's CO background concentrations for the years 1984 and 1987. By adjusting background values obtained from these maps for the project site according to regional emission projections for other years, background levels of 7.3 ppm and 3.7 ppm for one-hour and eight hour

averaging times, respectively, are obtained. They would apply to both Project and Baseline scenarios in 1997.

The contributions of local sources to the total CO concentration would vary from intersection to intersection, depending on traffic volume and the geometry of the intersection. Local effects for both Baseline and Project scenarios were estimated by using CALINE3 to model pollutant dispersion. Table 3.2.4-7 shows the worst-case curbside CO concentrations expected at ten selected intersections in the project vicinity for the two future scenarios.

Under the Baseline scenario, CO concentrations would either decrease or increase slightly from their 1988 levels at all intersections. Continuance of existing eight-hour standard violations is projected near the Highway 101 northbound on-ramps near Ignacio Boulevard during the evening peak commute period. Under the Project scenario, CO concentrations at most intersections would be greater than both existing and Baseline concentrations. Additional standard violations would occur at the intersections of the three site access roads with Nave Drive. The relative increases in CO concentrations would be most pronounced in the vicinity of the Alameda Del Prado interchange and at the intersections of the three site access roads with Nave Drive, but the highest CO concentration would occur near the northbound off-ramp near Ignacio Boulevard, where the levels would approach the one-hour CO standard. The above-mentioned violations of the CO standard caused by the project at the Nave Drive intersections would be considered significant adverse impacts.

During project operation, toxic emissions may occur from the R&D uses planned for the project site (see Section 3.1.8, Hazardous Materials). Unless control measures were implemented, R&D uses would be especially likely to emit quantities of toxic organic compounds, such as benzene, phenol, formaldehyde, methyl chloroform (TCA), and methylene dichloride. Project-related emissions of toxic air pollutants would be considered significant adverse impacts.

ALTERNATIVE 1: DECREASED HOUSING, INCREASED JOBS

ALTERNATIVE 2: DECREASED HOUSING, DECREASED JOBS

ALTERNATIVE 3: INCREASED HOUSING, DECREASED JOBS

TABLE 3.2.4-7
WORST-CASE CURBSIDE CARBON MONOXIDE CONCENTRATIONS AT
SELECTED INTERSECTIONS IN THE PROJECT VICINITY
(in ppm)¹

<u>Intersection</u>	<u>Averaging Time</u>	<u>Existing 1988</u>	<u>Baseline 1997</u>	<u>Project 1997</u>
Nave - South/ NB 101 Ramps	1-hr.	10.3	10.2	12.1
	8-hr.	5.6	5.7	7.0
Alameda del Prado/ Clay Court	1-hr.	10.6	10.3	12.4
	8-hr.	5.8	5.7	7.2
Alameda Del Prado SB 101 Ramps	1-hr.	10.5	10.6	12.0
	8-hr.	5.8	5.9	6.9
SB 101 Ramps Ignacio Blvd.	1-hr.	14.5	14.3	14.4
	8-hr.	8.6	8.5	8.6
Nave/101/NB/ Ignacio Blvd.	1-hr.	16.8	15.7	15.5
	8-hr.	10.2	9.5	9.4
Nave Drive/ NB 101 Off-Ramp	1-hr.	17.7	16.6	19.2
	8-hr.	10.8	10.1	12.0
Nave Drive/ Boling	1-hr.	11.4	11.6	13.7
	8-hr.	6.4	6.6	8.1
Nave Drive/ Main Gate Road	1-hr.	14.5	14.2	18.0
	8-hr.	8.6	8.5	11.1
Nave Drive/ State Access Road	1-hr.	13.9	13.6	17.3
	8-hr.	8.1	8.0	10.6
Nave Drive/ New Entrance Road	1-hr.	14.0	13.7	17.6
	8-hr.	8.2	8.1	10.8
Background	1-hr.	8.0	7.3	7.3
	8-hr.	4.0	3.7	3.7
Standards	1-hr.	20.0	20.0	20.0
	8-hr.	9.0	9.0	9.0

¹The tabulated concentrations, given in parts per million, are the sum of a background component, which includes the cumulative effects of all CO sources in the project vicinity, and a local component, which reflects the effects of vehicular traffic on roadways in the vicinity of the intersection. Background components were obtained by using procedures outlined in Air Quality and Urban Development, BAAQMD, November 1985. Local components were obtained by using the CALINE3 air quality model. See Appendix A for a listing of input parameters used with the CALINE3 model.

In addition to the project, three alternative development schemes for Hamilton Field are under consideration, all calling for different mixtures of housing and employment opportunities for the site. Air pollutant emissions estimates were carried out for each of the alternatives. Table 3.2.4-8 compares alternative emissions with the project, County, and Bay Area emissions.

Emissions from all of the alternatives would be less than those of the project. However, Alternative 1 and Alternative 3 would differ from the project by less than 5%, amounts not likely to result in measurable improvements in air quality. Alternative 2 would emit about 30% less air pollutants, resulting in a proportional improvement in air quality. However, the amount by which CO standards are exceeded at the most affected intersections is so great that a 30% drop in Hamilton Field's contribution to the problem would not be sufficient to remove the violations. Also, Alternative 2 emissions would still be large enough to be considered significant under the BAAQMD threshold of 1% of County emissions.

MITIGATION MEASURES

PROPOSED PROJECT

Demolition sites should be sprinkled with water continuously during demolition phases. Unpaved construction sites should be sprinkled with water at least twice per day. Stockpiles of soil, sand, and other such materials should be covered. Trucks hauling debris, soil, sand, or other such materials should also be covered. Streets surrounding demolition and construction sites should be swept at least once per day. The above measures would reduce TSP emissions.

Construction equipment engines should not be kept idling when not in use and should receive periodic maintenance; this would reduce emissions of air pollutant associated with their use.

The effects of the following traffic mitigation measures were incorporated into air quality analysis as reflected in their effects on the URBEMIS2 and CALINE3 projections:

TABLE 3.2.4-8
COMPARISON OF ALTERNATIVE EMISSIONS (TONS/DAY) WITH
PROJECT, COUNTY, AND BAY AREA POLLUTANT EMISSIONS

<u>Pollutant</u>	<u>Alternative #1¹</u>	<u>Comparison with</u>		
		<u>Project</u>	<u>County</u>	<u>Bay Area</u>
CO	6.795	+0.1%	5.4%	0.3%
ROG	0.600	-2.8%	2.5%	0.1%
NO _x	0.696	-3.6%	4.7%	0.1%
<u>Pollutant</u>	<u>Alternative #2</u>	<u>Project</u>	<u>County</u>	<u>Bay Area</u>
CO	4.661	-31.3%	3.7%	0.2%
ROG	0.391	-36.6%	1.7%	0.1%
NO _x	0.471	-34.8%	3.2%	0.1%
<u>Pollutant</u>	<u>Alternative #3</u>	<u>Project</u>	<u>County</u>	<u>Bay Area</u>
CO	6.505	-4.2%	5.2%	0.3%
ROG	0.611	-1.0%	2.4%	0.1%
NO _x	0.694	-3.9%	4.7%	0.1%

¹ Emissions due to vehicular sources were estimated by using the California Air Resources Board (CARB) URBEMIS2 model. An average vehicle speed of 35 mph, and ambient temperatures of 50°F for CO and 75°F for ROG and NO_x were assumed. Emissions due to residential stationary sources were estimated by applying generic emission factors developed by the BAAQMD. The BAAQMD has also developed emission factors for commercial/industrial stationary sources, but they vary greatly depending on the nature of the commercial/industrial activity. Consequently, the tabulated alternative emissions do not include commercial/industrial stationary sources.

Regional Transit and Roadway Improvements

- o A new route by Golden Gate Transit providing commuter service to Bel Marin Keys by 1989-1990.
- o A proposed new route by Golden Gate Transit connecting Sonoma and Marin Counties via Bel Marin Keys and Hamilton Field.
- o Extension of HOV lanes on Highway 101 from the Marinwood interchange to State Route 37.

Project Roadway Improvements

- o A new northbound on-ramp between Alameda del Prado and Ignacio Boulevard at the location of the existing off-ramp to Nave Drive.
- o A new main access road to the site, termed New Entrance Road.
- o Widening of the Ignacio Boulevard overcrossing and the provision of an additional lane for movements to Hamilton Field.
- o Elimination of the left-turn lane from Ignacio Boulevard to Northbound Highway 101.
- o Installation of traffic signals at the intersections of New Entrance Road, State Access Road, and Main Gate Road with Nave Drive, and at the Alameda del Prado/Clay Court intersection.
- o Realignment of Roblar Drive to intersect the Highway 101 ramps.
- o Widening of State Access Road to four lanes.
- o Widening of Nave Drive to five lanes between State Access Road and Ignacio Boulevard.

Proposed Traffic Reduction Plan

A Transportation System Management (TSM) program was developed by Wilbur Smith Associates to mitigate project and cumulative traffic impacts through a more efficient use of existing and future roadway capacity. The following traffic reduction measures were proposed by the project sponsor and their effects were incorporated into the TSM program.

- o Provision for a transit station site adjacent to the NWPRR right-of-way.
- o Payment of a public transit fee of \$1.00 per square foot of commercial space built and occupied.

- o Car pool and van pool incentives, including park-and-ride lots, on-site car pool and van pool applicant matching, and priority parking for poolers.
- o Shuttle bus service for workers living off-site but nearby.
- o Requirements for staggered hours or flextime programs by major employers.
- o Parking management strategies, including preferential treatment of car poolers and control of parking supply.
- o A monitoring program, including the installation of traffic counters and annual surveys of employees.
- o Provision of bikeways and bicycle lockers.

It is estimated that the above-mentioned measures would reduce project vehicle trips by about 18%. Therefore, the project's vehicle-related emissions of air pollutants given in Table 3.2.4-6 and the project's contributions to ambient CO levels given in Table 3.2.4-7 are about 18% lower than they would have been without the proposed TSM program. Even with this reduction, however, project emissions of air pollutants would still be greater than 1% of County totals and CO emissions from project traffic would aggravate violations of the 8-hour CO standard near the Ignacio Boulevard interchange and would directly cause similar violations at the intersections of the project access roads with Nave Drive. The BAAQMD would consider all these effects to be significant adverse impacts on air quality.

Implementation of measures identified to alleviate energy impacts would also mitigate air quality impacts.

During the operation phase of project development, all uses which may emit significant quantities of criteria or toxic pollutants should be covered by BAAQMD PSD permits. Such permits would regulate the emission levels of such pollutants and encourage the implementation of control measures, such as carbon absorption or catalytic oxidation of toxic vapors.

ALTERNATIVE 1: DECREASED HOUSING, INCREASED JOBS
ALTERNATIVE 2: DECREASED HOUSING, DECREASED JOBS
ALTERNATIVE 3: INCREASED HOUSING, DECREASED JOBS

Mitigation as required for the proposed project would apply equally to Alternatives 1, 2 and 3.

¹ Acceptable concentration levels for some pollutants are chosen after careful review of available data on health effects. Pollutants subject to federal ambient standards are sometimes referred to as criteria pollutants because the EPA publishes criteria documents to justify the choice of standards.

² An inversion is a condition under which warm air aloft limits upward movement of pollutants contained in a colder layer of air near the surface.

³ Air Quality and Urban Development, Bay Area Air Quality Management District, November, 1985, p. VI-19.

⁴ Air Quality and Urban Development, BAAQMD, November 1985, p. VIII-2.

SUMMARY COMPARISON OF IMPACTS AND MITIGATION MEASURES

3.2.4 AIR QUALITY

	IMPACT	MITIGATION
PROPOSED PROJECT	<p>Construction activities would temporarily increase particulate and CO concentrations on and near construction sites and may result in violations of the Federal and State PM and CO standards.</p> <p>Vehicles would be the primary source of additional air pollutants resulting from project operation. Emissions of reactive organic compounds and nitrogen oxides from these sources would be considered a significant addition to County and Bay area totals.</p> <p>A worsening of existing eight-hour CO standard violations near the Ignacio Boulevard northbound on-ramps and the creation of new eight-hour CO standard violations near the intersections of Nave Drive with the three project access roads are projected.</p> <p>Toxic emission may occur from the R&D uses planned for the project site.</p>	<p>Demolition sites should be sprinkled with water continuously during demolition phases. Unpaved construction sites should be sprinkled with water at least twice per day. Stockpiles of soil, sand, and other such materials should be covered. Trucks hauling debris, soil, sand or other such materials should be also be covered. Streets surrounding demolition and construction sites should receive periodic maintenance.</p> <p>Mitigation measures, such as roadway improvements and TSM measures, to alleviate traffic impacts would also reduce air quality impacts. However, the projected 18% reduction in traffic generated by the project TSM measures would not be sufficient to reduce air quality impacts below the accepted levels of significance.</p> <p>Mitigation measures, such as roadway improvements and TSM measures, to alleviate traffic impacts would also reduce air quality impacts. However, the projected 18% reduction in traffic generated by the project TSM measures would not be sufficient to reduce CO impacts below the accepted levels of significance.</p> <p>All uses which may emit significant quantities of toxic pollutants should be covered by BAAQMD PSD permits. Such permits would regulate the emission levels of such pollutants and encourage the implementation of control measures, such as carbon absorption or catalytic oxidation of toxic vapors.</p>
ALTERNATIVE 1: (Decreased Housing, Increased Jobs)	Impacts would be the same as for the proposed project.	Mitigation measures would be the same as for the proposed project.
ALTERNATIVE 2: (Decreased Housing, Decreased Jobs)	Although a decrease in air pollutant emissions of about 30% would result from the implementation of this alternative, the levels of significance attached to the remaining emissions would be the same as for the proposed project.	Mitigation measures would be the same as for the proposed project.
ALTERNATIVE 3: (Increased Housing, Decreased Jobs)	Impacts would be the same as for the proposed project.	Mitigation measures would be the same as for the proposed project.

3.2.5 NOISE

SETTING

Acoustic Fundamentals

Sound is a mechanical form of radiant energy which is transmitted by pressure waves in the air. It is characterized by two parameters: amplitude and frequency.

The term amplitude signifies the difference between ambient air pressure and the peak pressure of the sound wave. Amplitude is measured in decibels (dB) on a logarithmic rather than a linear scale. As a consequence, the pressure difference in a 10 dB sound is 10 times that of a 0 dB sound, a 20 dB sound is 100 times greater, a 30 dB sound 1000 times, and so on. Another feature of the decibel scale is the way in which sound amplitudes from multiple sources add. A 65 dB point source of sound, say a truck, when joined by another similar source results in a sound amplitude of 68 dB, not 130 dB (i.e., doubling the source strength increases the sound pressure by 3 dB). Amplitude is interpreted by the ear as corresponding to different degrees of loudness. Laboratory measurements correlate a 10 dB increase in amplitude with a perceived doubling of loudness and establish a 2 dB change in amplitude as the minimum audible difference for the average person.

Frequency refers to the number of fluctuations of the pressure wave per second. The unit of frequency is the Hertz (abbreviated Hz; one Hz equals one cycle per second). The human ear is not equally sensitive to sound of different frequencies. Sound waves below 16 Hz or above 20,000 Hz cannot be heard at all, and the ear is more sensitive to sound in the higher portion of this range than in the lower. To approximate this sensitivity, environmental sound is usually measured in A-weighted decibels (dBA). On this scale, the normal range of human hearing extends from about 0 dBA to about 140 dBA.

Noise is unwanted and disturbing sound. The human response to environmental noise is subjective and varies considerably from individual to individual. The effects of noise can range from interference with sleep, concentration, and communication, to physiological and psychological stress, and, at the highest intensity levels, to hearing loss. Sleep disturbance occurs when interior noise levels exceed 40 to 50 dBA. The passage of a heavy truck can generate sound in excess of 90 dBA. Jet takeoffs at 200 feet amount to about 120 dBA.

Environmental noise fluctuates in intensity over time and several indicators of time-averaged noise levels are in use. Three most commonly used are L_{eq} , L_{dn} , and CNEL. L_{eq} , the energy equivalent noise level, is a measure of the average energy content (intensity) of noise over any given period of time. L_{dn} , the day-night average noise level, is the 24-hour average of the noise intensity, with a 10 dBA "penalty" added for nighttime noise (10:00 PM to 7:00 AM) to account for the greater sensitivity to noise during this period. CNEL, the community equivalent noise level, is similar to L_{dn} , but adds a 5 dBA penalty to evening noise (7:00 PM to 10:00 PM). In situations where vehicles are the dominant source of noise, L_{eq} , L_{dn} and CNEL of the same noise source for the peak commute hour usually differ by less than 2 dBA.

Regulatory Background

The Health and Safety Element of the City of Novato's General Plan defines acceptable interior and exterior noise levels for various land uses within its jurisdiction. These standards are shown in Tables 3.2.5-1 and 3.2.5-2.

Federal Aviation Regulation (FAR) Part 150 requires the implementation of an airport noise compatibility program. Residential land uses are considered to be compatible in a noise environment of 65 dBA L_{dn} or less. Commercial, manufacturing, and production uses are considered to be compatible up to 70 dBA with no special interior noise level reduction measures, up to 75 dBA with interior noise level reduction of 25 dBA, and up to 80 dBA with interior noise level reduction of 30 dBA.

California Administrative Code (CAC) Title 21 (formerly Title 4) establishes limitations for airport noise in existing residential areas, under a phased schedule of criterion CNEL's. Up until December 1985, the criterion was 70 dBA CNEL. Beginning in 1986, the criterion was lowered to 65 dBA. Airports are required to establish the noise impact boundary for the applicable criterion by monitoring noise levels in residential areas. Commercial and industrial land uses, and property subject to a navigation easement for noise, are considered compatible uses within the noise impact boundary; residential and school uses are not.

CAC Title 25 requires that for multi-unit residential buildings (including hotels, motels, apartments, and dwelling units other than single family detached units), the annualized

TABLE 3.2.5-1
CITY OF NOVATO OUTDOOR NOISE STANDARDS

Land Use Category	Community Noise Exposure, L_{dn} or CNEL, dBA						
	50	55	60	65	70	75	80
Residential - Low Density Single Family, Duplex Mobile Homes	a	a/b	b	b	c	d	d
Residential - Multifamily	a	a/b	b	b	c	d	d
Transient Lodging - Motels, Hotels	a	a	b	b	c	c	d
Schools, Libraries, Churches, Hospitals, Nursing Homes	a	a	b	b	c	c	d
Auditoriums, Concert Halls, Amphitheatres	b	b	b	b	d	d	d
Sports Areas, Outdoor Spectator Sports	b	b	b	b	b	d	d
Playgrounds, Neighborhood Parks	a	a	a	a	c	c	d
Golf Courses, Riding Stables, Water Recreation, Cemeteries	a	a	a	a	c	c	d
Office Buildings, Business Commercial and Professional	a	a	a	a	b	b	c
Industrial, Manufacturing, Utilities, Agriculture	a	a	a	a	b	b	c

KEY:

- Normally Acceptable - land use is satisfactory, buildings need no special noise insulation.
- Conditionally Acceptable - new construction should be undertaken only after acoustic analysis and installation of noise insulation.
- Normally Unacceptable - new construction should be discouraged. If construction does proceed, acoustic analysis and insulation required.
- Clearly Unacceptable - new construction should not be undertaken.

TABLE 3.2.5-2
CITY OF NOVATO INDOOR NOISE STANDARDS

Use	L_{dn}	Basis for Standard
RESIDENTIAL:		
All	45	Undisturbed sleep
COMMERCIAL:		
Hotel - Motel	45	Undisturbed sleep
Executive Offices, Conference Rooms	55	Speech - 3.5 meters - Normal Voice
Staff Offices	60	Speech - 2 meters - Normal Voice
Restaurant, Markets, Retail Stores	60	Speech - 2 meters - Normal Voice
Sales, Secretarial	65	Speech - 1 meter - Normal Voice
Sports Arena, Bowling Alley, etc.	75	Speech - 0.7 meter - Raised Voice
INDUSTRIAL:		
Offices (same as above)	55-60	
Laboratory	60	Speech - 2 meters - Normal Voice
Machine Shop, Assembly, etc.	75	Speech - 0.7 meter - Raised Voice
PUBLIC OR SEMI-PUBLIC FACILITY:		
Concert Hall, Theater	30	Prevent disruption of performance
Auditorium, Movie Theatre, Church	45	Prevent disruption of performance Speech - 20 meters - Raised Voice
Hospital, Nursing Home	45	Undisturbed sleep
School Classrooms	50	Speech - 6 meters - Normal Voice
Library	50	Minimize interruption of reading
Other	55	Speech - 3.5 meters - Normal Voice

interior noise levels not to exceed 45 dBA. Such residential buildings proposed for sites having an exterior CNEL of 60 dBA or more must be analyzed to ensure that the structures would effectively reduce exterior noise levels to an interior CNEL of 45 dBA or less.

Noise Environment - Project Site and Vicinity

The project site is subject to noise from several sources, including automobile and truck traffic, passing trains, aircraft takeoffs, landings, and overflights, and natural sources such as the wind. Acoustic surveys and analyses of the project site have been done by Fitzroy-Dobbs and by M.A.G. Consultants. The findings of these surveys are summarized below as they apply to defining the existing acoustic conditions.

The major sources of time-averaged ambient noise in the area are highways, such as U.S. 101 and S.R. 37, and major arterial/collector streets, such as Alameda del Prado, Ignacio Boulevard, and Nave Drive. All the above-mentioned sources are located outside the perimeter of the project site. U.S. 101 and Nave Drive have the most pronounced effect on land uses along the western boundary of the project site. Measurements taken over a 24-hour period at the Lanham Housing development indicate existing L_{dn} of 67.3 dBA, while peak hour measurements at Hamilton School and Meadow Park School have registered L_{eq} 's of 58.3 dBA and 61.1 dBA, respectively. At present, two roads give access to the site from Nave Drive, Main Gate Road and State Access Road. Existing L_{dn} 's at 100 feet from the roadway centerlines (and not including the effects of Highway 101 and Nave Drive) were estimated to be 52.8 dBA and 54.3 dBA, respectively.

The project site is traversed by the tracks of the Northwest Pacific Railroad. At present, Northwest Pacific does not run any trains south of the crossing with Ignacio Boulevard, except by special order, and there have been no trains crossing the project site since August 1985.

Runway 12-30 of Hamilton Field is adjacent to the northern boundary of the project site. At this time Hamilton is an Army airfield and is restricted to use by military aircraft only. The present activity, as reported by the Army, is an annual average of 1896 operations by fixed wing aircraft, 36 helicopter operations using regular flight paths, and some 3600 helicopter training movements. The latter are usually "touch and go"

maneuvers that are generally confined to the southern end of the field and to low altitudes. There are no nighttime operations. These operations are estimated to produce infrequent maximum A-weighted single-event noise levels of 80 dBA on the runway side of Ammo Hill and Reservoir Hill, and 75 dBA on the runway side of WAF Hill. The estimated annual average CNEL or L_{dn} at all three hills are estimated to be less than 50 dBA.

IMPACTS

PROPOSED PROJECT

Construction Impacts

Construction activities would temporarily generate high noise levels on and around the site over the entire period of project construction. Table 3.2.5-3 shows outdoor noise levels likely to be experienced during construction phases. Since noise from localized sources typically falls off by about 6 dBA with each doubling of distance from source to receptor, receptors located within about 1400 feet of construction would experience noise greater than 60 dBA during the noisiest phases of construction. Noise abatement provided by walls, windows, and doors of existing structures would reduce indoor noise levels by 15 to 50 dBA, depending on such factors as the material composition of the wall, wall/window area ratio, etc. A 15 dBA reduction is typical of most residential construction. Construction noise would disturb concentration and communication near the construction sites and may disrupt sleep and other activities inside nearby buildings. Because the project would be developed in multiple phases, construction noise generated in later phases would affect occupied buildings nearby which were developed in earlier phases.

Operational Impacts

Future noise levels on and around the project site would be influenced by the increase in vehicular traffic drawn to the area by the project and other developments. Table 3.2.5-4 shows the distances from the curbside of local roadways to the existing and future (existing + cumulative + project) 60, 65, and 70 dBA L_{dn} contours. Comparison of these distances indicates that positions of the future noise contours will change significantly from their existing locations.

The noise contours shown in Table 3.2.5-4 were calculated without taking into account acoustic attenuation afforded by the project structures. In actuality, the row of

TABLE 3.2.5-3
TYPICAL CONSTRUCTION NOISE LEVELS AT 50 FEET (dBA)¹

Construction Phase	Commercial/Industrial Construction Average Noise Level	Housing Construction Average Noise Level
Ground Clearing	84	84
Excavation	89	88
Foundations	78	81
Erection	85	82
Finishing	89	88

¹ Taken from Noise from Construction Equipment and Operations, Building Equipment, and Home Appliances, prepared by Bolt, Beranek, and Newman for the U.S. Environmental Protection Agency, December 31, 1971, p. 20.

TABLE 3.2.5-4
DISTANCES TO L_{dn} NOISE CONTOURS ALONG MAJOR ROADWAYS ON AND
NEAR THE PROJECT SITE (FEET FROM CURBSIDE)

Location	Existing L _{dn}			Future L _{dn}		
	L _{dn} =60	L _{dn} =65	L _{dn} =70	L _{dn} =60	L _{dn} =65	L _{dn} =70
East of Nave Drive	4,951	1,486	390	8,081	2,480	709
Along Main Gate Road (East of Nave but not including the effects of Hwy 101 or Nave)	*	*	*	52	*	*
Along State Access Road (East of Nave but not including the effects of Hwy 101 or Nave)	*	*	*	131	30	*

Estimates based on FHWA Highway Traffic Noise Prediction Model, U.S. Department of Transportation, December 1978.

* Traffic not sufficient to generate noise at this level.

structures closest to the roadway would provide 3-5 dBA of shielding, and other structures would attenuate the noise further. With this attenuation, noise levels would decline more rapidly beyond the 70 dBA contour than indicated in Table 3.2.5-4.

Lanham Housing and Meadow Park School are already exposed to noise levels considered high for their land use, and these levels will increase significantly in the future. The City of Novato outdoor noise standards discourage new residential construction and require acoustic analysis and insulation for construction that occurs in areas where noise levels reach or exceed 70 dBA. Lanham Housing outdoor noise levels are already over 70 dBA. This may cause violations of Novato's indoor residential noise standard of 45 dB CNEL.

The right-of-way occupied by the Northwest Pacific track crossing the project site is currently being studied as a potential transit corridor. At this stage of planning, neither the route length or the mode of transportation has been defined, although a light rail system and a bus-only roadway have been proposed. Commute buses on the Northwest Pacific right-of-way would generate peak AM commute hour noise levels of 71 dBA at 100 feet from the centerline of the bus lane.

If Hamilton Field continues to operate at the same level in the future as it does at present, the noise generated by aircraft activity would be too sporadic to have a significant influence on noise levels on the project site, except in the hangar area where taxiing, ground run-up, and helicopter movements would be most audible. A study of more intensive aviation uses for Hamilton Field (250,000 annual operations by the year 2004) plotted CNEL contours around the runway under these conditions.¹ The CNEL on the airfield side of Ammo Hill and Reservoir Hill would be 55 to 60 dBA by the year 2004, and would be 50 to 55 dBA on WAF Hill. Therefore, all of the project site at a distance greater than 1000 to 1100 feet from the centerline of the runway would be outside the 55 dBA CNEL contour.

ALTERNATIVE 1: DECREASED HOUSING, INCREASED JOBS
ALTERNATIVE 2: DECREASED HOUSING, DECREASED JOBS
ALTERNATIVE 3: INCREASED HOUSING, DECREASED JOBS

Noise impacts relating to the project as proposed would not differ significantly for each of the three alternatives.

TABLE 3.2.5-5
TYPICAL CONSTRUCTION EQUIPMENT NOISE (dBA)¹

Equipment Type	Noise Level at 50 Feet	
	Without Noise Control	With Feasible Noise Control ²
Earthmoving:		
Front Loaders	79	75
Backhoes	85	75
Dozers	80	75
Tractors	80	75
Scrapers	88	80
Graders	85	75
Trucks	91	75
Pavers	89	80
Materials Handling:		
Concrete Mixers	85	75
Concrete Pumps	82	75
Cranes	83	75
Derricks	88	75
Stationary:		
Pumps	76	75
Generators	78	75
Compressors	81	75
Impact:		
Pile Drivers	101	95
Jack Hammers	88	75
Rock Drills	98	80
Pneumatic Tools	86	80
Other:		
Saws	78	75
Vibrators	76	75

¹Taken from Noise from Construction Equipment and Operations, Building Equipment, and Home Appliances, prepared by Bolt, Beranek, and Newman for the U.S. Environmental Protection Agency, December 31, 1971.

²Estimated levels obtainable by selecting quieter procedures or machines and implementing noise control features requiring no major redesign or extreme cost.

MITIGATION MEASURES

PROPOSED PROJECT

Construction work should be limited to daylight hours, and all equipment and operations with a high noise potential should be muffled to the degree shown in Table 3.2.5-5.

Noise walls along Highway 101 and/or Nave Drive are needed to protect Lanham Housing and Meadow Park School from existing and future traffic noise. The results of a study of the attenuation effectiveness of noise walls near Lanham Housing are presented in Table 3.2.5-6. The calculations indicate that the best placement for such a wall would be just east of Nave Drive. An 8-foot wall at that location would be sufficient to maintain noise levels near their present values. However, a 12-foot wall would be necessary to reduce noise levels below the 65 dBA upper limit of conditional acceptability under Novato's noise standards. A similar study recently completed by CalTrans called for the construction of a 12-foot wall between Highway 101 and Nave Drive along the school frontage to reduce noise to acceptable levels on school property.

Development of single and multi-unit residential uses on the project site in areas inside the 65 dBA CNEL contour would require an acoustical analysis and noise insulation to ensure that interior noise levels do not exceed 45 dBA CNEL.

Development of industrial, office, R&D, and warehouse land uses would be compatible with City noise regulations in all areas of the project site outside the 70 dBA L_{dn} contour. However, acoustical analyses should be performed on all uses near Nave Drive, as well as special uses (e.g., hotel, recreation centers, or hospitals), wherever located, to assure that interior noise standards are met.

All new residential, office, R&D, and warehouse land uses proposed for the project site would be compatible with noise levels characteristic of the existing intensity of aircraft usage of Hamilton Field as specified under FAR Part 150 and CAC Title 21. However, to prepare for the eventuality of aircraft use intensification at Hamilton Field, no residential uses should be located closer than 1000 to 1100 feet from the runway centerline.

TABLE 3.2.5-6
NOISE WALL ATTENUATION ESTIMATES

Noise Source: Traffic on Highway 101/Nave Drive

Receptor Location: Lanham Housing Project; Building 1143

Predicted Noise Level – L_{dn} (dBA)

Scenario	No Wall	Wall East of Highway 101 Wall Height			Wall East of Nave Drive Wall Height		
		8 Feet	10 Feet	12 Feet	8 Feet	10 Feet	12 Feet
Existing (First Floor)	66.0	--	--	--	--	--	--
Future + Project (First Floor)	68.0	66.4	65.8	65.3	63.9	63.6	62.9
Change from Existing	+2.0	+0.5	-0.2	-0.7	-2.1	-2.4	-3.1
Existing (Second Floor)	70.3	--	--	--	--	--	--
Future + Project (Second Floor)	72.2	69.1	68.4	67.9	67.0	65.6	64.7
Change from Existing	+2.0	-1.1	-1.9	-2.4	-3.3	-4.6	-5.5

Estimates based on FHWA Highway Traffic Noise Prediction Model U.S. Department of Transportation, December 1978.

ALTERNATIVE 1: DECREASED HOUSING, INCREASED JOBS
ALTERNATIVE 2: DECREASED HOUSING, DECREASED JOBS
ALTERNATIVE 3: INCREASED HOUSING, DECREASED JOBS

Noise mitigation for the project as proposed would apply equally to Alternatives 1, 2 and 3.

¹ Environmental Assessment on Joint Military/Civilian General Aviation Use of Hamilton Army Airfield, Novato, California, Turner Collie & Braden, October 1984.

SUMMARY COMPARISON OF IMPACTS AND MITIGATION MEASURES

3.2.5 NOISE

	IMPACT	MITIGATION
PROPOSED PROJECT	<p>Construction activities would temporarily generate high noise levels that could disturb sleep and other activities inside nearby buildings.</p> <p>Lanham Housing and Meadow Park School are exposed to noise levels considered high for their land use, and these levels will increase significantly in the future.</p>	<p>Construction work should be limited to daylight hours, and all equipment and operations with a high noise potential should be muffled.</p> <p>Noise walls along Highway 101 and/or Nave Drive will be required to protect Lanham Housing and Meadow Park School from existing and future traffic noise.</p>
ALTERNATIVE 1: (Decreased Housing, Increased Jobs)	Noise impacts for this alternative would not be significantly different than for the project as proposed.	Noise mitigation would be as required for the project as proposed.
ALTERNATIVE 2: (Decreased Housing, Decreased Jobs)	Noise impacts for this alternative would not be significantly different than for the project as proposed.	Noise mitigation would be as required for the project as proposed.
ALTERNATIVE 3: (Increased Housing, Decreased Jobs)	Noise impacts for this alternative would not be significantly different than for the project as proposed.	Noise mitigation would be as required for the project as proposed.

4 GROWTH INDUCEMENTS

4.1 GENERAL

The development of Hamilton Field would affect growth in the region. Workers at Hamilton Field would live in other communities in the northern Bay Area and stimulate growth in those areas. Each direct job created at Hamilton Field would create approximately two additional secondary jobs generated by new business start-ups and expansions of existing businesses that would either provide goods and services to Hamilton Field firms, or that would prosper from the increased earnings and expanded consumer purchasing power created by the new jobs at Hamilton Field.¹ This secondary job growth would in turn stimulate an increase in the regional population and labor force.

The following section summarizes the regional growth impacts of the project and the alternatives while Section 4.3 provides a more detailed description of the numbers of jobs, households and people induced by the development. Section 4.4 discusses in general terms the types of impacts associated with regional growth while Section 4.5 provides a detailed comparison of project growth with ABAG projections. Since ABAG procedures have been used in estimating regional multipliers effects, it is reasonable to believe that the growth inducing impacts of the project would have been reflected in the published regional ABAG projections. However, ABAG actually projected for fewer jobs and housing at the Hamilton site between 1990 and 2000 than are proposed by the project sponsor or supported by the market research conducted for this EIR. Therefore, not all of the secondary impacts of the project as proposed are captured in the current ABAG projections. Therefore, an analysis has been prepared to show what portion of the project's regional growth impacts are above and beyond the growth levels reflected in Projections '87 by ABAG.

4.2 GROWTH SUMMARY

The relationship between household generation, employment growth and housing demand within the Marin-Sonoma County region is complex, and in terms of the Hamilton Field project would be based on the relative number of housing units and jobs to be provided at Hamilton Field. Regional growth is influenced by both the residential distribution of the Hamilton workforce (see Section 3.1.3, Employment, Housing and Population and Appendix B for information relating to residential location of the Hamilton workforce), and the estimates of the distribution of secondary jobs around the region.²

The residential location of the project work force is estimated on the basis of historical commute patterns, housing availability and housing affordability. The analysis indicates that about 46% of the on-site work force would live in Marin County and an additional 36% would live in Sonoma County. In terms of secondary job growth, about 56% would occur in Marin County, and 29% in Sonoma County. The relationship of this growth to other projected development in these areas is shown in Table 4-1. The alternatives analysis illustrates the growth dynamics occurring in the region. A reduction in project housing and an increase in project jobs (Alternative 1) would induce more jobs than the proposed project throughout the region and would expand household formation growth in South Marin and Sonoma County. Thus, Alternative 1 has a higher regional impact both because of the increased jobs and reduced housing opportunities on-site. Decreasing project housing and decreasing project jobs (Alternative 2) would create fewer jobs and households than the proposed project within the region with the exception of South Marin where household growth would be slightly above the proposed project (workers would be commuting from areas outside of Novato because of the reduced number of housing units available at Hamilton Field).

Alternative 3 has the lowest regional growth impact by expanding project housing and reducing on-site project jobs. However, household growth within Novato would be the same as for the proposed project.

Table 4-2 has been constructed to indicate the distribution of new jobs, households, population, and labor force around the region. The table shows the estimated amount of growth that Novato, South Marin County, and Sonoma County would experience from the project and each alternative development scenario for Hamilton Field. These figures reflect all the direct and indirect growth associated with the development.

TABLE 4-1

SUMMARY OF JOBS AND HOUSEHOLD GROWTH
(NUMBERS IN PARENTHESES INDICATE % CHANGE FROM PROJECT AS PROPOSED)

	<u>Percent Addition To 1990 Job Base</u>		<u>Percent of Projected Job Growth 1990-2000</u>		<u>Percent Addition to 1990 Household Total</u>		<u>Percent of Projected Household Growth 1990-2000</u>	
PROPOSED PROJECT								
Novato	37.1		53.1		19.0		58.8	
South Marin	8.2		32.7		1.2		12.8	
Sonoma County	3.0		9.9		1.4		6.0	
ALTERNATIVE 1: Decreased Housing, Increased Jobs								
Novato	41.3	(+11.3%)	55.5	(+4.5%)	18.1	(-5.7%)	57.3	(-2.5%)
South Marin	9.1	(+10.9%)	35.0	(+7.0%)	1.4	(+16.6%)	15.0	(+17.2%)
Sonoma County	3.3	(+10.0%)	10.9	(+10.0%)	1.6	(+14.3%)	6.6	(+10.0%)
ALTERNATIVE 2: Decreased Housing, Decreased Jobs								
Novato	33.4	(-9.9%)	50.5	(-4.9%)	11.7	(-39.0%)	46.6	(-20.7%)
South Marin	7.5	(-8.5%)	30.5	(-6.7%)	1.2	(0%)	12.9	(+0.8%)
Sonoma County	2.7	(-10.0%)	9.1	(+8.1%)	1.3	(-7.1%)	5.5	(-8.3%)
ALTERNATIVE 3: Increased Housing, Decreased Jobs								
Novato	24.4	(-34.2%)	42.7	(-19.6%)	19.2	(0%)	58.8	(0%)
South Marin	5.3	(-35.4%)	23.8	(-27.2%)	0.7	(-41.7%)	8.3	(-35.1%)
Sonoma County	2.9	(-3.3%)	6.7	(-32.3%)	1.0	(-28.6%)	4.1	(-31.7%)

Source: Applied Development Economics

Note: These figures reflect the projections shown in Table 4-4.

TABLE 4-2

PROJECTIONS OF POPULATION, LABOR FORCE, JOBS AND HOUSEHOLD GROWTH
CAUSED BY THE PROPOSED DEVELOPMENT OF HAMILTON FIELD, 1990 - 2000

<u>Proposed Project</u>	<u>Novato</u>	<u>South Marin</u>	<u>Sonoma</u>
Total Households	4,120	880	2,070
New Population	9,080	1,970	5,010
Total Labor Force	5,640	1,220	2,750
Total Jobs	8,780	6,280	4,190
ALTERNATIVE 1: Decreased Housing, Increased Jobs			
Total Households	3,880	1,060	2,290
New Population	8,590	2,360	5,550
Total Labor Force	5,340	1,460	3,050
Total Jobs	9,780	6,960	4,640
ALTERNATIVE 2: Decreased Housing, Decreased Jobs			
Total Households	2,520	800	1,880
New Population	5,700	1,990	4,550
Total Labor Force	3,540	1,230	2,500
Total Jobs	7,900	5,690	3,800
ALTERNATIVE 3: Increased Housing, Decreased Jobs			
Total Households	4,120	540	1,360
New Population	8,980	1,210	3,290
Total Labor Force	5,580	750	1,810
Total Jobs	5,780	4,060	2,710

Source: EIP ASSOCIATES, Applied Development Economics, and ABAG Projections 87.

Notes:

Data is based upon EIP's calculation of the residential location of the Hamilton workforce combined with ADE's estimate of population, labor force participation, and employment among residents who live at the project site, but work outside of Hamilton Field.

Projections included in this table do not include the proposed project's effects on the Napa/Vallejo and East Bay area. It is estimated that 400 or fewer project workers would live in each of these areas creating a negligible impact on each area.

Novato data includes workers living at Hamilton Field and the rest of Novato.

Total jobs includes both the direct and indirect jobs created by the employment multipliers of the Hamilton Field project.

4.3 GROWTH INDUCEMENTS FROM HAMILTON FIELD

PROPOSED PROJECT

Growth in Novato

The project sponsor proposes to build 3,550 new housing units and 2.9 million square feet of office, R&D industrial and commercial space, which would accommodate 7,300 employees at Hamilton Field, of which 7,130 would be new jobs. It is estimated that the new jobs at Hamilton Field would create an additional 14,170 secondary jobs in the region, and approximately 1,610 of the secondary jobs would be located in Novato. Thus, the proposed project would create a total of 8,780 new direct and secondary jobs in the City of Novato at project completion. The proposed project would also lead to the formation of 4,120 new households, and add 9,080 new persons to Novato's population base between 1990 and 2000.

The proposed project would add 8,780 jobs, as noted above, to Novato's 1990 job base of 23,700, which would be a growth of 37.1%. The proposed project would account for more than half of Novato's projected job growth for the period of 1990 to 2000 (see Table 4-3).

The proposed project would also increase Novato's housing stock by 3,550 units, and would lead to the formation of 4,120 new households as noted previously who would seek housing in Novato. This means that the proposed project would lead to the formation of a net total of 570 new households who would seek housing in Novato in addition to those households that would live at Hamilton Field. New households that would be formed would increase Novato's 1990 projected supply of 21,400 households by 19.2%. Moreover, the proposed project would account for nearly 60% of all the 1990 to 2000 projected household growth in Novato (see Table 4-3).

Growth in South Marin

The proposed project would also create growth in South Marin County. Job growth would be particularly significant since approximately 6,280 of the 14,170 secondary jobs created in the region would locate in South Marin County. The job growth created in South Marin County as a result of the proposed project would represent an 8.2% increase in South Marin's 1990 projected job base of 76,370 jobs, and account for 40.7% of the approximately one-third increase in jobs that would be projected to occur between 1990 and 2000 (see Table 4-4).

TABLE 4-3
ESTIMATES OF GROWTH ABOVE THE ABAG PROJECTIONS
FROM THE PROPOSED PROJECT AND THREE ALTERNATIVES AT HAMILTON FIELD

	<u>Novato</u>	<u>South Marin</u>	<u>Sonoma</u>
ABAG PROJECTIONS (Year 2000)			
Households	25,330	82,660	178,800
Population	65,600	175,350	432,050
Labor Force	40,780	108,990	237,500
Jobs	34,200	91,800	178,700
GROWTH OF PROPOSED PROJECT ABOVE ABAG PROJECTIONS (Year 2000)			
Net Household Growth	3,070	580	1,460
Net Population Growth	5,900	1,320	3,530
Net Labor Force Growth	3,670	820	1,940
Net Job Growth	6,020	3,800	2,860
GROWTH OF ALTERNATIVE 1 ABOVE ABAG PROJECTIONS (Year 2000)			
Net Household Growth	2,840	750	1,680
Net Population Growth	5,410	1,710	4,070
Net Labor Force Growth	3,360	1,060	2,240
Net Job Growth	7,050	4,480	3,310
GROWTH OF ALTERNATIVE 2 ABOVE ABAG PROJECTIONS (Year 2000)			
Net Household Growth	1,480	590	1,270
Net Population Growth	2,520	1,340	3,080
Net Labor Force Growth	1,520	830	1,690
Net Job Growth	5,140	3,210	2,470
GROWTH OF ALTERNATIVE 3 ABOVE ABAG PROJECTIONS (Year 2000)			
Net Household Growth	3,070	240	750
Net Population Growth	5,810	560	1,820
Net Labor Force Growth	3,610	350	1,000
Net Job Growth	3,020	1,580	1,380

Source: EIP ASSOCIATES, Applied Development Economics, and ABAG Projections 87.

Notes: Growth Projections measures the difference between the growth induced from each project alternative and the ABAG Projections for each region.

TABLE 4-4
REGIONAL PROJECTIONS WITH THE PROPOSED PROJECT ALTERNATIVES

	<u>Novato</u>	<u>South Marin</u>	<u>Sonoma</u>
PROPOSED PROJECT			
Households	28,400	83,240	180,270
Population	71,500	176,670	435,580
Labor Force	44,440	109,810	239,440
Jobs	40,220	95,600	181,560
Alternative 1			
Households	28,170	83,410	180,490
Population	71,010	177,060	436,120
Labor Force	44,140	110,050	239,740
Jobs	41,220	96,280	182,010
Alternative 2			
Households	26,810	83,250	180,080
Population	68,120	176,690	435,130
Labor Force	42,340	109,820	239,190
Jobs	39,340	95,010	181,170
Alternative 3			
Households	28,400	82,900	179,560
Population	71,410	175,910	433,870
Labor Force	44,390	109,340	238,500
Jobs	37,220	93,380	180,080

Note: This table reflects the sum of the ABAG projections and the net growth figures shown in Table 4-3.

Source: Applied Development Economics.

Household and population growth in South Marin resulting from the project would be less significant than the job growth resulting from the project. It is estimated that Hamilton Field project workers would form 880 households in South Marin which would not generate a significant impact on total housing demand. That is, 880 new households would represent 1.2% of South Marin's 1990 base of 76,370 households. However, project-induced new household formation in South Marin would account for 12.8% of the new households that would be formed between 1990 and 2000.

Growth in Sonoma County

The proposed project would create job, population, and household growth in Sonoma County. Approximately 4,190 of Hamilton Field's secondary jobs would be located in Sonoma County, which would amount to 3% of the County's 1990 base of 139,400 jobs.³ Moreover, the proposed project would account for 9.9% of the new jobs that would be projected for Sonoma County between 1990 and 2000 (see Table 4-3).

It is estimated that Hamilton Field workers would form 2,070 new households in Sonoma County, adding 1.4% to Sonoma County's 1990 total of 145,920 households. The proposed project would account for 6.0% of the new households that would be projected to be formed in Sonoma County between 1990 and 2000 (see Table 4-3).

ALTERNATIVE 1: DECREASED HOUSING, INCREASED JOBS

Growth in Novato

Alternative 1 would include 3,250 new housing units and 3.5 million square feet of office, R&D, industrial and commercial space, which would accommodate 8,030 employees at Hamilton Field, of which 7,960 would be new jobs. It is estimated that Alternative 1 would create an additional 15,740 secondary jobs in the region, and approximately 1,820 of the secondary jobs would be located in Novato. Thus, project Alternative 1 would create a total of 9,780 direct and secondary jobs in the City of Novato. Alternative 1 would also lead to the formation of 3,880 new households, and add 8,590 new persons to Novato's population base between 1990 and 2000.

Alternative 1 would add 9,780 jobs to Novato's 1990 job base as noted above, whereas the proposed project would add 8,780 jobs to Novato's 1990 job base. Thus, the direct and

indirect jobs created by Alternative 1 would add 41.3% to Novato's projected 1990 job base of 23,700 jobs. Alternative 1 would account for 55.8% of the jobs that would be projected to grow in Novato between 1990 and 2000 (see Table 4-3).

Alternative 1 would also increase Novato's housing stock by 3,250 units, and lead to the formation of 3,880 new households who would seek housing in Novato. Thus, Alternative 1 would lead to the formation of a net total of 630 new households who would seek housing in Novato in addition to the household formation that would occur at Hamilton Field. Accordingly, household formation that would occur under Alternative 1 would be slightly higher than the net total of 567 new households who would seek housing under the proposed project.

Growth in South Marin

Approximately 6,960 secondary jobs created by Alternative 1 would locate in South Marin County, which would be 680 more jobs than would be created in South Marin by the proposed project. Alternative 1 would result in a 9.1% expansion of the South Marin's 1990 job base, and would account for 35.0% of projected job growth between 1990 and 2000 (see Table 4-3).

Alternative 1 would lead to the formation of 1,060 new households in South Marin, whereas 880 new households would be formed in South Marin under the proposed project. The 1,060 new households would represent 1.4% of South Marin's total households, but would account for 15.0% of South Marin's projected household growth between 1990 and 2000 (see Table 4-3).

Growth in Sonoma County

Approximately 4,640 secondary jobs created by Alternative 1 would locate in Sonoma County, which would be 220 more jobs than would be created in Sonoma County by the proposed project. Alternative 1 would result in a 3.3% expansion of Sonoma County's 1990 job base, and it would account for 10.9% of Sonoma County's projected job growth between 1990 and 2000 (see Table 4-3).

More households would also be formed in Sonoma County under Alternative 1 than under the proposed project. It is estimated that 2,290 new households would be formed in Sonoma County under Alternative 1, whereas 2,070 new households would be formed in Sonoma County under the proposed project. The 2,290 new households would represent 1.6% of Sonoma County's total households, but would account for 6.6% of the County's projected household growth between 1990 and 2000 (see Table 4-3).

ALTERNATIVE 2: DECREASED HOUSING, DECREASED JOBS

Growth in Novato

Alternative 2 would include the construction of 2,000 new housing units and 2.87 million square feet of office, R&D, industrial, and commercial space, which would accommodate 6,560 employees at Hamilton Field, of which 6,430 would be new jobs. It is estimated that the new jobs at Hamilton Field would create an additional 12,860 secondary jobs in the region, and approximately 1,470 of the secondary jobs would be located in Novato. Thus, Alternative 2 would create a total of 7,900 direct and secondary jobs in the City of Novato. Alternative 2 would also lead to the formation of 2,520 new households, and add 5,700 new persons to Novato's population base.

Alternative 2 would add 7,900 jobs to Novato's projected 1990 job base of 23,700 jobs, which would be 880 fewer jobs than the proposed project, and 1,880 fewer jobs than Alternative 1. The direct and indirect jobs created by Alternative 2 would add 33.4% to Novato's projected 1990 job base, and still account for about half of the 10,500 jobs that would be projected to grow in Novato between 1990 and 2000 (see Table 4-3).

Alternative 2 would increase Novato's housing stock by 2,000 units, and would lead to the formation of 2,520 new households. Thus, Alternative 2 would lead to the formation of a net total of 520 new households that would seek housing in Novato. Alternative 2 would put less pressure on Novato's housing supply than either the proposed project or Alternative 1. That is, 40 fewer households would seek housing in Novato under Alternative 2 than the proposed project, and 110 fewer households would seek housing under Alternative 2 than under Alternative 1.

Growth in South Marin

Approximately 5,690 secondary jobs created by Alternative 2 would locate in South Marin, which is 590 fewer jobs than the proposed project, and 1,260 fewer jobs than Alternative 1. Alternative 2 would result in a 7.5% expansion of the South Marin's 1990 job base, and would account for 30.5% of the area's projected job growth between 1990 and 2000 (see Table 4-3).

Alternative 2 would lead to the formation of nearly the same number of households in South Marin as would be formed by the proposed project. There would be the formation of 890 new households in South Marin under Alternative 2, nearly the same number of new households that would form in South Marin under the proposed project, but 170 fewer households than would be formed under Alternative 1. The new households formed under Alternative 2 would represent 1.2% of South Marin's total households, but would account for 12.8% of the projected household growth between 1990 and 2000 (see Table 4-3).

Growth in Sonoma County

Approximately 3,800 secondary jobs created by Alternative 2 would locate in Sonoma county which would be 390 fewer jobs than under the proposed project, and 840 fewer jobs than under Alternative 1. Alternative 2 would result in a 2.7% expansion of the Sonoma County's 1990 job base, and account for 9.1% of County's projected job growth between 1990 and 2000 (see Table 4-3).

It is estimated that Alternative 2 would lead to the formation of 1,880 new households in Sonoma County, which would be 190 fewer households than would be formed under the proposed project, and 410 fewer households than would be formed under Alternative 1. The 1,880 new households would represent 1.3% of Sonoma County's total households, but would account for 5.5% of the County's projected household growth between 1990 and 2000 (see Table 4-3).

ALTERNATIVE 3: INCREASED HOUSING, DECREASED JOBSGrowth in Novato

A third alternative would develop 3,750 new housing units and 1.92 million square feet of office, R&D, industrial and commercial space, which would accommodate 4,800

employees, of which 4,670 would be new jobs. It is estimated that the new jobs at Hamilton Field would create an additional 9,230 secondary jobs in the region, and approximately 1,110 of the secondary jobs would be located in Novato. Thus, Alternative 3 would create approximately 5,780 direct and secondary jobs in the City of Novato. Alternative 3 would also lead to the formation of 4,118 new households, and add 8,984 new persons to Novato's population base.

Alternative 3 would create fewer jobs in the City of Novato than either the proposed project, or Alternatives 1 and 2. Alternative 3 would add 5,780 jobs to Novato's 1990 job base, which would be 3,000 fewer jobs than the proposed project, 4,000 fewer jobs than Alternative 1, and 2,120 fewer jobs than Alternative 2. The direct and indirect jobs created by Alternative 3 would add 24.4% to Novato's projected 1990 job base of 23,700 jobs, and account for 42.7% of the jobs that would be projected for Novato between 1990 and 2000 (see Table 4-3).

Alternative 3 would increase Novato's housing stock by 3,750 units, and would lead to the formation of 4,120 new households that would seek housing in Novato. Thus, Alternative 3 would lead to the formation of a net total of 370 new households that would seek housing in Novato. Alternative 3 would put less pressure on Novato's supply of existing housing stock than either the proposed project, or Alternatives 1 and 2. Alternative 3 would lead to a net total of 200 fewer households who would seek housing in Novato than under the proposed project, 260 fewer households than under Alternative 1, and 150 fewer households than under Alternative 2.

Growth in South Marin

Approximately 4,060 secondary jobs created by Alternative 3 would be located in South Marin County, which would be 2,220 fewer jobs than under the proposed project, 2,900 fewer jobs than under Alternative 1, and 1,630 fewer jobs than under Alternative 2. Alternative 3 would result in a 5.3% expansion of South Marin County's 1990 job base, and account for 23.8% of the area's projected job growth between 1990 and 2000 (see Table 4-3).

Alternative 3 would lead to the formation of 540 new households in South Marin, which would be 340 fewer households than under the proposed project, 520 fewer households than

under Alternative 1, and 350 fewer households than under Alternative 2. The new households formed in South Marin under Alternative 3 would represent 0.7% of South Marin's total households, and would account for 8.3% of the area's projected household growth between 1990 and 2000 (see Table 4-3).

Growth in Sonoma County

Approximately 2,710 secondary jobs created by Alternative 3 would locate in Sonoma County, which would be 1,480 fewer jobs than under the proposed project, 1,930 fewer jobs than under Alternative 1, and 1,090 fewer jobs than under Alternative 2. Alternative 3 would result in a 2.9% expansion of Sonoma County's 1990 job base, and account for a 6.7% expansion of the County's projected job growth between 1990 and 2000 (see Table 4-3).

Alternative 3 would also lead to the formation of fewer households in Sonoma County than would the proposed project or Alternatives 1 and 2. It is estimated that the formation of 1,380 new households would occur in Sonoma County under Alternative 3, which is 710 fewer households than under the proposed project, 930 fewer households than under Alternative 1, and 520 fewer households than under Alternative 2. The 1,380 new households would represent 1% of Sonoma County's total households, and it would account for 4.1% of the County's projected household growth between 1990 and 2000 (see Table 4-3).

4.4 IMPACTS OF GROWTH

Growth and the rate of growth shapes both the physical and social structure of communities. The proposed project would contribute to growth within the Bay Area, with the greatest emphasis in growth occurring within Marin and Sonoma Counties. The project could be considered conducive to stimulating other residential and commercial development within Marin and Sonoma counties as explained above. The additional workers, new residents and their dependents could generate additional demands on transportation facilities, public services, utilities, natural resources and related systems throughout the region, not unlike the improvements to services and transportation systems associated with the project itself. The need for expansion of such facilities to serve secondary growth and the impacts of such expansion cannot be determined specifically at

this time, but would be subject to separate environmental review as public services, utilities and transportation facilities are proposed for development in the future; assessment of these improvements is beyond the scope of this report.

In addition to increased demand on public services and facilities, regional development trends, particularly the development of vacant land, normally create secondary growth inducements in terms of intensified land use (infill), increased job opportunities and increased municipal tax revenues. Increases in population also would require additional goods and services from the private sector, and contribute to stimulating retail sales. Project construction would generate jobs in the construction, materials fabrication and supply industries up until the time of full project implementation. The provision of construction jobs for the project would also have secondary impacts on the economy for additional goods and services. It would be expected that most of the labor force constructing the project would be hired from within the Bay Area, and that some employees currently working on construction in the Bay Area might transfer from those projects, when completed, to work at Hamilton Field.

The proposed project in concert with other projects (cumulative development) would magnify the impacts on public services, utilities, transportation systems and local economies in proportion to the total magnitude of cumulative development. However, a portion of the primary and secondary growth generated by the Hamilton Field project and other projects in the region is reflected in the ABAG projection of growth for the Bay Area over the duration of the planning period, to the year 2005. To the extent growth inducements associated with the project are also reflected in the ABAG projections, then it may be argued that only that increment of growth above the ABAG projections could be considered truly growth inducing (see part 4.5 below, Comparison of Project Growth with ABAG Projections).

4.5 COMPARISON OF PROJECT GROWTH WITH ABAG PROJECTIONS

In order to provide local planners with an indication of how the proposed project and the three alternatives would affect the ABAG projections, Table 4-3 has been prepared which measures the additional growth that the project as proposed and each of the alternatives would have above current ABAG projections on the City of Novato, South Marin County and Sonoma County. The projections that have been prepared by ABAG for the year 2000,

shown in the top portion of the table, do include some growth for Hamilton Field, but ABAG has assumed significantly less growth than proposed by the project sponsor.⁴ Thus, a portion but not all of the regional growth effects of Hamilton have been captured in the 1987 ABAG projections for the year 2000, resulting in the potential for unforeseen growth inducements in Marin and Sonoma Counties, and to a lesser extent, elsewhere in the Bay Area.

Specifically, ABAG projects that 2,250 new jobs and 850 new households would be formed at Hamilton Field between 1990 and 2000. This means that the proposed project would directly create 4,920 more jobs, and lead to the formation of 2,700 more households than projected by ABAG. Alternative 1 would create 5,710 more jobs, and lead to the formation of 2,400 more households than projected by ABAG. Alternative 2 would create 4,180 more jobs, and lead to the formation of 1,150 more households than projected by ABAG. Alternative 3 would create 2,110 more jobs and lead to the formation of 2,900 more households than projected by ABAG.

The ABAG projections would be lower than the plans of the project sponsor, partly because ABAG projected the development of Hamilton Field to be spread out over a longer period of time than has been proposed by the project sponsor (see Section 2.4, Project Characteristics and Scheduling). For example, ABAG projects an additional growth of 610 jobs and 1,180 households at Hamilton Field between the years 2000 and 2005. Thus, to some extent the difference between the ABAG projections and the proposed project and Alternatives 1, 2 and 3 is one of timing rather than magnitude of growth. If the project is built out according to the schedule as proposed, communities in Marin and Sonoma Counties would have to adjust to the growth effect sooner than might otherwise be the case.

Measurements of project induced growth beyond the ABAG projections were made by first subtracting out both the direct and secondary growth that ABAG assumed would occur at Hamilton between 1990 and 2000. Once all the effects of Hamilton Field were subtracted out of the ABAG projections, the direct and secondary growth for the proposed project and each alternative were added back into the projections and compared with the projections published in the ABAG document.⁵ Comparing the resulting projections which included the current Hamilton Field project (see Table 4-3), with the projections

published in Projections 87 gives an indication of the change in regional growth created by the proposed project.

Briefly summarizing Table 4-3, the proposed project would create 6,020 more jobs in Novato than projected for the year 2000 in ABAG's published report Projections 87. Likewise, the proposed project would create 3,800 additional jobs in South Marin County and 2,860 additional jobs in Sonoma County above the ABAG projections for the year 2000. The proposed project would also lead to the formation 3,070 additional households in Novato, 580 additional households in South Marin County, and 1,460 additional households in Sonoma County above the ABAG projections for the year 2000. The additional households would all be seeking housing in their respective jurisdictions.

Alternative 1 would create 7,050 more jobs in Novato than projected for the year 2000 in ABAG's published report Projections 87. Alternative 1 would also create 4,480 additional jobs in South Marin County and 3,310 additional jobs in Sonoma County above the ABAG projections for the year 2000. Alternative 1 would also lead to the formation of 2,840 additional households in Novato, 750 additional households in South Marin County, and 1,680 additional households in Sonoma County above the ABAG projections for the year 2000.

Alternative 2 would create 5,140 more jobs in Novato than projected for the year 2000 in ABAG's published report Projections 87. Alternative 2 would also create 3,210 additional jobs in South Marin County and 2,470 additional jobs in Sonoma County above the ABAG projections for the year 2000. Alternative 2 would also lead to the formation of 1,480 additional households in Novato, 590 additional households in South Marin County, and 1,270 additional households in Sonoma County above the ABAG projections for the year 2000.

Finally, Alternative 3 would create 3,020 more jobs in Novato than projected for the year 2000 in ABAG's published report Projections 87. Alternative 3 would also create 1,580 additional jobs in South Marin County and 1,380 additional jobs in Sonoma County above the ABAG projections for the year 2000. Alternative 3 would lead to the formation of 3,070 additional households in Novato, 240 additional households in South Marin County, and 750 additional households in Sonoma County above the ABAG projections for the year 2000.

¹The multiplier methods discussed in the ABAG report, 1982 Input-Output Model and Economic Multipliers for the San Francisco Bay Region, (1986) were used to calculate the magnitude and distribution of secondary jobs around the region. Total secondary jobs in the region were made by using the ABAG Type II employment multipliers for each land use proposed for Hamilton Field. The ABAG recommendations were adopted for calculating the multipliers that Hamilton Field would create for both Marin County and the City of Novato. The reader is encouraged to refer to Section 3.1.3, Employment, Housing and Population and Technical Background Document B for information relating to residential location of the Hamilton workforce.

²For this analysis, ABAG projections have been used as a basis for evaluating future regional growth. For the most part, ABAG projections are consistent with the plans of local jurisdictions, particularly in Marin County. San Rafael is currently considering a general plan change that would add some 3,500 dwelling units to ABAG projections; however, such a change would serve to reinforce the conclusion of the residential location analysis in the EIR that sufficient housing will be available south of the project site to support historical commute patterns in Marin County (please refer to Technical Background Document B for further discussion of this project).

Sonoma County, however, believes ABAG has overstated the number of future employed residents in that County. Under the ABAG projections, the number of commuters traveling to jobs out of Sonoma County would be higher than the County Planning Department's estimates (Richard Lektiman, Senior Planner). If this is true, then the cumulative growth-inducing and transportation impacts of the Hamilton Field project will be lower than stated in this EIP.

³The magnitude of secondary jobs located in Sonoma County is assumed to relate to the portion of Hamilton Field workers who would live in Sonoma County. Since the secondary growth projected for Sonoma County also includes employment associated with Hamilton business activity as well as Hamilton worker households, the magnitude of secondary growth in Sonoma County should be considered a rough estimate. That is, the distribution of secondary job growth would be subject to local public policy decisions. For example, through restrictive land use regulation, local governments in South Marin County could push their market share of the Hamilton Field secondary job growth into Sonoma County or another neighboring jurisdiction. Likewise, land use restrictions in Sonoma County could push Hamilton Field's secondary job growth into the East Bay, Solano or Napa County.

⁴The current project proposal and Alternatives 1, 2 and 3 are less in magnitude than the previous project proposed at the time ABAG prepared Projections 87. Therefore the total growth effects of the current project and Alternatives 1, 2 and 3 are less than would otherwise have occurred if the previous project proposal had been adopted (see Section 2.2, Project History).

⁵In order to subtract out, then add back in the secondary growth in the analysis, the multiplier methods discussed in the ABAG Input-Output Model were used.

UNAVOIDABLE SIGNIFICANT
ADVERSE IMPACTS

5 UNAVOIDABLE SIGNIFICANT ADVERSE IMPACTS^{1,2,3}

TRAFFIC AND TRANSPORTATION

At project buildout, key traffic impacts of the project would occur north of the site on the northbound U.S. 101 lanes during the evening peak hour and on the southbound U.S. 101 lanes in the morning peak hour. The project would add traffic to the freeway in the peak travel directions which are currently characterized by poor operating conditions. The existing freeway with the planned HOV lanes south of Highway 37 would not be sufficient to accommodate the traffic generated by the project and cumulative growth, and additional improvements currently being studied would be needed.

VISUAL QUALITY

Although the project would remove the blighted appearance of Hamilton Field, new foreground buildings would increase the visual presence of site construction along the Highway 101 corridor. Because of its size and extent of development proposed, the project at full buildout would reinforce the awareness of development along the Highway 101 corridor.

VEGETATION AND WILDLIFE

As proposed in the Master Plan, the project could result in a net loss of wetland habitat values. It is likely the project would not receive a U.S. Army Corps of Engineers Section 404 permit unless the proposed wetlands mitigation plan demonstrates no net loss of wetland habitat value and that there are no reasonable alternatives to the proposed filling of the wetlands. Without the Section 404 permit, the proposed wetland filling would not be allowed.

AIR QUALITY

Violations of 8-hour carbon monoxide standards are predicted for the Ignacio Boulevard/ Highway 101 interchange, Nave Drive/Main Gate Road intersection, Nave Drive/State Access Road intersection and Nave Drive/New Entrance Road intersection, resulting from cumulative plus project-induced traffic.

¹Based on regional earthquake history and area geology, potentially damaging earthquake-induced groundshaking could occur on the project site and adjacent areas at any time. This would apply to the proposed project, but would not be project-induced.

²CEQA: The California Environmental Quality Act, Law and Guidelines, June, 1986, published by the California Office of Planning and Research, defines "significant" as follows:

15002 (g)

"A significant effect on the environment is defined as a substantial adverse change in the physical conditions which exist in the area affected by the proposed project."

15064 (a)

"Determining whether a project may have a significant effect plays a critical role in the CEQA process."

15064 (b)

"The determination of whether a project may have a significant effect on the environment calls for careful judgment on the part of the public agency involved, based to the extent possible on scientific and factual data. An ironclad definition of significant effect is not possible because the significance of an activity may vary with the setting. For example, an activity which may not be significant in an urban area may be significant in a rural area.

15064 (h)

"In marginal cases where it is not clear whether there is substantial evidence that a project may have a significant effect on the environment, the Lead Agency shall be guided by the following factors:

"(1) If there is serious public controversy over the environmental effects of a project, the Lead Agency shall consider the effect or effects subject to the controversy to be significant. . .

"(2) If there is disagreement between experts over the significance of an effect on the environment, the Lead Agency shall treat the effect as significant. . ."

³The impacts identified in this section pertain to the project as proposed in the Master Plan.

ALTERNATIVES TO THE
PROPOSED PROJECT

6 ALTERNATIVES TO THE PROPOSED PROJECT¹

This portion of the EIR describes a number of alternatives to the project that have been considered by the City of Novato and the project sponsor. This section also discusses the No-Project alternative as required by the California Environmental Quality Act. In addition it should be noted that Technical Background Document J addresses alternative project locations and is titled Hamilton Field Alternatives Analysis Under Section 404(b)(1) of the Clean Water Act of 1977, As Amended.

The consideration of alternatives herein is not to be confused with the three alternative development scenarios analyzed in parallel with the proposed project in the main body of the EIR.

6.1 NO PROJECT²

If the proposed project is not constructed, current physical conditions of the site would remain for an unspecified period of time. Under the No-Project alternative, the Federal Government would reconsider its options for releasing control of the property, assuming no transfer of title were to be made to the Berg-Revoir Corporation. This alternative would not necessarily preclude transfer of ownership to another developer, or transfer of portions of the property to several developers, wherein development proposals that are different from the current proposal could be presented. Additionally, should the Federal Government retain Hamilton Field, it cannot be ruled out that the military would investigate the potential for constructing additional housing for military personnel and their dependents at Hamilton. There could also be the deferment of the cleanup of toxic and hazardous materials on the project site for an unspecified period of time. In any event, maintaining the site in its current condition for the time being would preclude the identified impacts associated with the proposed project.

There would be no grading induced erosion and the potential for sediment accumulation in the project site waterways. Slope instabilities related to hillside grading would not occur above and beyond the existing conditions. The project site would remain within the designated 100-year floodplain and flood proofing would not occur; current erosion, drainage and flooding conditions would continue to deteriorate. Water ways on the site would lack maintenance, causing possible downstream water quality degradation. There would be no alteration of wetland habitat, reduction in the existing deer population, and no added pollutants to the waterways and wetlands.

There would be no project-related inducements on population growth, nor would there be growth associated with secondary employment. There would be no project induced increase in the demand for local public and utility services. There would be no increased consumption of nonrenewable energy resources that would otherwise be associated with construction and operation of the project. Neither the City of Novato, special service districts, County, or private service providers would experience a change in revenues or costs otherwise associated with the project. Visual and blighted conditions of the project site would remain unaltered; the hills would not receive new construction and visual complexity of the site would not be increased. Currently abandoned buildings would remain on the site and continue to age and deteriorate creating a hazard to the public.

New opportunities for rental housing of the type contemplated by the project sponsor would not be provided on the project site at this time. There would be no commercial, retail, or R&D and health care land uses provided at this time. Buildings on the site that otherwise would have been rehabilitated would likely not receive adequate maintenance, and deteriorate over time unless maintained by the property owner.

Traffic volumes would be expected to remain at levels consistent with existing land uses at Hamilton Field. Thus, in the short term, no increase in traffic volumes would be expected. In the long run, traffic volumes would be dependent on any site development which would ultimately occur as defined below; a certain level of increase would result from regional cumulative development unrelated to the reuse of Hamilton Field.

The No-Project alternative would hold open options for the project site to be developed in accordance with the Novato General Plan in the future under development scenarios that

differ from the current proposal. This would also include the potential for subdivision of the land into smaller parcels, wherein differing and unrelated site design concepts could emerge in the absence of sound, comprehensive planning. In view of the failure of past initiatives to allow general aviation use at Hamilton Field (see Appendix A, History of Hamilton Field), it is doubtful the General Services Administration would emphasize use of the Base for general aviation.

Development of the site as a whole would allow for the coordination of internal vehicular and pedestrian circulation, and a more uniform treatment of architectural style, building layout and landscape development. Long-term deferment of development could also give time for existing General Plan requirements and zoning codes to be amended, affecting the ultimate buildout potential of the site.

6.2 CITY OF NOVATO ADOPTED LAND USE PLAN ALTERNATIVE

The City of Novato has recognized the opportunity for the development of Hamilton Field since deactivation was announced by the Department of Defense in 1974, and that development of Hamilton Field could help meet major community needs.

In 1979, the City and County of Marin adopted land use goals and criteria for the reuse of Hamilton Field. The goals and criteria did not include a specific land use plan, but were expressed through a narrative on the types of development desired and on various related issues such as access and circulation. Subsequently, the Land Use Plan for Reuse of Portions of Hamilton Air Force Base was prepared and adopted by the City Council on December 11, 1984. The Land Use Plan was prepared to: 1) update the 1979 goals and criteria, 2) illustrate land use plans, and 3) guide the disposal process by the U.S. General Services Administration.

The Novato Adopted Land Use Plan alternative is generally similar to the project Master Plan as proposed, but differs in several respects. For example, the Adopted Land Use Plan would provide more conservation/buffer area (open space) than the proposed Master Plan, provide vehicular access to Bel Marin Keys, provide office densities less than called for in the Master Plan, and combine office and residential use on the same parcel(s) or within individual buildings. Where the Adopted Land Use Plan would generally compare equally with the Master Plan as proposed, the impacts of implementing the Adopted Land

Use Plan would be similar to the impacts of implementing the Master Plan. The impacts of implementing the Adopted Land Use Plan alternative, where this alternative differs from the Master Plan, are as discussed in this section.

Although the proposed project includes 452.1 acres of land, including ten parcels totalling 50.7 acres owned by the military currently under negotiation for acquisition by the Berg-Revoir Corporation, the Novato Land Use Plan deals with about 430 acres of land. However, the Land Use Plan policies pertain to some of the military inholdings so that general policy direction is applicable.³

LAND USE PLAN ASSUMPTIONS

Various assumptions established in preparing the Land Use Plan include the fact that many of the existing roads and utilities may not be adequate for new development; a number of existing buildings may be adaptable for reuse while others are obviously not suitable for non-military use; flat areas to the west on the site may be developed with typical drainage measures while lands to the east would require flood control measures; the Navy is currently constructing additional military housing south of the project site and reuse plans must be coordinated with the Navy housing plans; and the Army and Coast Guard have aviation missions using the flight line and runway areas which may or may not be permanent.

Other assumptions in preparing the Land Use Plan include preservation of the Northwestern Pacific Railroad right-of-way for future public transit use; there will be no public aviation use at Hamilton Field; aviation use will be limited so as to not constitute a significant use constraint on the reuse area; utility capacity exists or can be provided for up to 1,000 dwelling units and 10,000 employees or an equivalent demand; and circulation/access improvements can be provided for up to 1,000 dwelling units and 10,000 employees or an equivalent demand with acceptable levels of service within and outside the reuse area.

POTENTIAL USES

The intent of the Land Use Plan is to establish "flexible guidelines" for development. Favored uses include shopping and services for existing and future residents of the

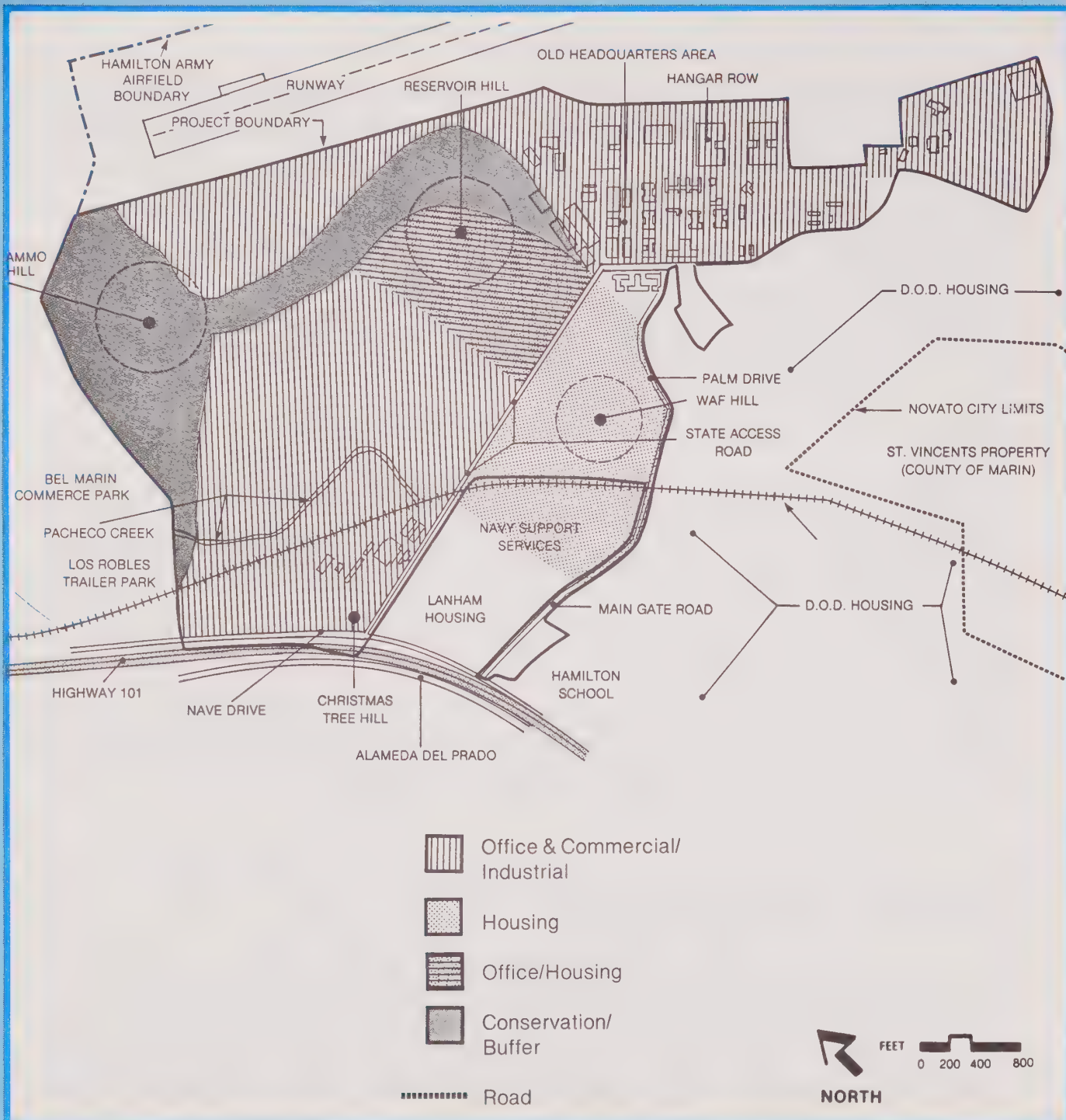
immediate area; entertainment or recreational uses for the area residents of a scale or type which could not be located in central Novato; motel and conference facilities; a range of medium and high density housing, including low and moderate cost housing; large and small scale businesses, especially those offering employment to the classes of workers who presently commute from Novato to areas south of Novato (a limited area can be used for construction related businesses, such as building supplies and storage yards); and public/institutional uses for the convenience of existing and future Hamilton residents, including uses for the general public convenience which could not locate elsewhere.

GOALS

The expressed goals of the Land Use Plan include producing jobs for local residents; producing job opportunities which minimize traffic impacts, including promoting contra-flow travel in the 101 corridor (northbound in the morning, southbound in the evening); providing development with maximum benefit to the taxpayers of Novato; achieving development which meets local needs and is complementary to the existing community; developing the property as expeditiously as economic circumstances and public service availability permit; including provisions for multi-modal transportation linkages; and providing for all available technologies such as energy conservation and communication linkages to make development competitive in the open market.

The adopted Land Use and Circulation Plan is shown in Figure 6-1 for comparison with the proposed Project Master Plan in Figure 6-2.

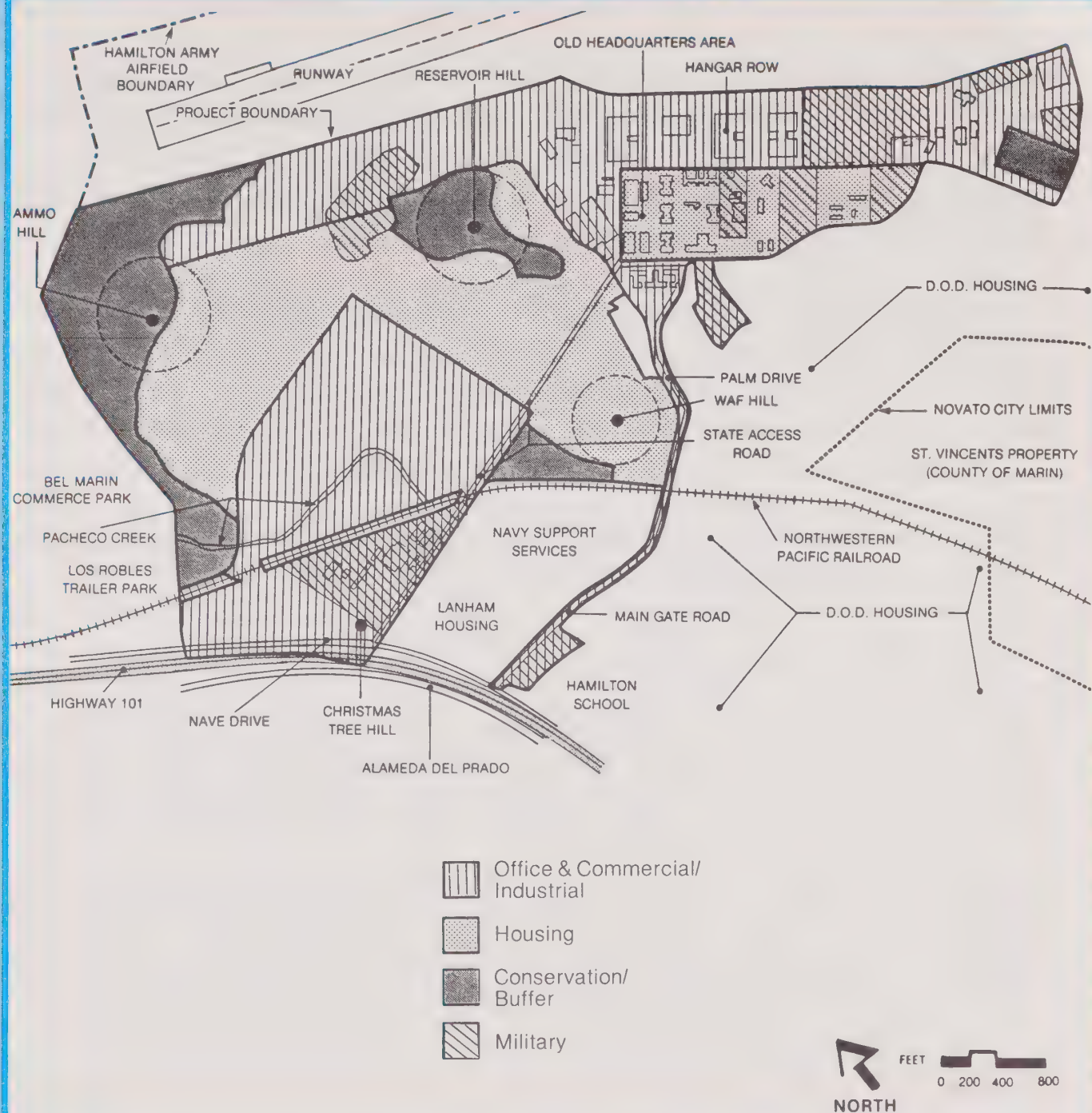
Under the Adopted Land Use Plan alternative, three-story buildings would be 50% less in height than the project as proposed. The Adopted Land Use Plan alternative would, therefore, reduce the visibility of the office portion of the project from off-site locations. The reduction in visibility would be for the most part related to constructing 3-story buildings, which would give the project less prominence when viewed from Highway 101. There would also be a reduced concentration of workers in the central portion of the project near the proposed transit station, which would detract from the goal of encouraging transit use and providing less dependence on the automobile for commuting, particularly if the total office space proposed for the project were to be maintained for the Adopted Land Use alternative. This is because reduced building heights would require more land coverage over a greater area to maintain the amount of office space proposed.



HAMILTON FIELD MASTER PLAN EIR

CITY OF NOVATO ADOPTED LAND USE PLAN ALTERNATIVE

FIGURE 6-1



HAMILTON FIELD MASTER PLAN EIR

MASTER PLAN



FIGURE 6-2

SOURCE BERG-REVOIR CORPORATION

With 10,000 employees, the Adopted Land Use Alternative would generate about 25% more traffic than the project as currently proposed, significantly impacting traffic along the U.S. 101 corridor. With 1,000 housing units, this alternative would not offer a jobs/housing balance sufficient to mitigate the generation of commute traffic, or mitigate the need for housing this alternative would create.

The Adopted Land Use Plan alternative could include a regional shopping center. The alternative of a regional shopping center on the project site is discussed in Section 7.3, Other Alternatives Studied. Shopping center use in this alternative would diverge from the Master Plan proposal in that shops and restaurants would be provided in one- to three-story structures instead of the ground floor of office buildings up to six stories tall. Three-story structures would reduce the perceived intensity of land use and the project would be less visible from Highway 101 than if six-story structures were constructed (see Section 3.1.9, Visual Quality).

6.3 OTHER ALTERNATIVES STUDIED

In preparing the Hamilton Field Master Plan, the project sponsor investigated a number of general alternatives to the project as proposed. These alternatives consisted of variations on land use including increased emphasis on the provision of housing, no housing and more office space, a regional shopping center, a project of decreased intensity and other land use variations. These alternatives and their relative impacts are briefly described below. The alternatives (excluding the Increased Housing and Decreased Retail Use alternative described last) were rejected by the project sponsor in favor of the project as currently proposed, which generally represents to the project sponsor the optimum combination of land uses consistent with market demand for housing, office space, R&D space, health care facilities and supporting land uses.

In addition, as noted previously, in December of 1985, a Master Plan proposal prepared for the development of Hamilton Field was submitted to the City of Novato for review and approval. The Master Plan proposal provided for 2,500 dwelling units and 4,082,000 sq.ft. of floor area for office, R&D, health care, commercial and warehousing space capable of supporting 11,100 jobs. It was subsequently determined by the project sponsor that the Master Plan proposal thus being evaluated was no longer under submittal for review and that a revised Master Plan application would be prepared and submitted to the City for review.

The revised Master Plan application is evaluated in this EIR. It should be noted that the impacts of the earlier Master Plan were evaluated in a Draft EIR issued in December of 1986 with the City of Novato serving as Lead Agency. The impacts of the earlier Master Plan proposal were generally somewhat greater than those of the project as currently proposed, particularly with respect to traffic. This is because the project contained more job producing land uses than the current proposal. However, it is not the purpose of this EIR to provide an evaluation of the earlier Master Plan proposal. The three alternatives studied in parallel with the current Master Plan proposal in this EIR provide a frame of reference within which elements of the earlier project are included.

6.3.1 ALL RESIDENTIAL DEVELOPMENT

The feasibility of providing up to 8,000 residential units on the project site with no office or research and development land uses was considered by the project sponsor. However, the All Residential Development alternative would contain several similar impacts as for the proposed project. For example, there would be the potential for erosion from site grading activities and sediment accumulation in the project's waterways, particularly during the construction phases. Slope instabilities related to hillside grading would occur above and beyond the existing conditions. The site would remain within the designated 100-year floodplain and flood proofing would be needed.

There would be a net decrease in solid waste generation, and net increase in wastewater flow and water demand relative to the project as proposed. The net resident population on the site would increase, creating a corresponding increase in the demand for police protection, fire protection, library, school and other public services.

Assuming a distribution of unit sizes, types and affordability levels equal to the proposed project, the All Residential Alternative would provide positive impacts in housing conditions in the Marin-Sonoma County area, presently an area with low rental housing vacancy rates. This alternative would contain approximately 14,700 people at full occupancy.

The trip distribution characteristics of this alternative would be different than those of the project as proposed. The greatest impact would be in the southbound direction to locations south of the site during the morning peak hour and in the northbound direction

from the south in the evening peak hour. Traffic impacts would be greatest south of the project site, above the impacts of the project as proposed.

The existing hangars would remain unused. Residential construction in the hangar area would not be possible due to noise and safety setback requirements associated with aviation use of the existing air strip. The All Residential Project Alternative would not be consistent with the adopted Novato General Plan goals and policies for reuse of Hamilton Air Force Base (see Section 3.1.1, Planning and Relationship to Plans).

6.3.2 ALL OFFICE/R&D/COMMERCIAL DEVELOPMENT

The All Office/R&D/Commercial Development alternative would afford the opportunity to provide job possibilities for residents of Novato and surrounding areas within Marin and south Sonoma Counties. This alternative would promote increased economic development in the area and increased tax revenues for local government. This alternative would also preclude residential development on the project site creating a potential imbalance in job opportunities and housing availability.

The All Office/R&D/Commercial Development alternative would potentially allow Hamilton Field to become the major regional employment center in northern Marin County, depending on market demand.

The impacts respecting soils, drainage and vegetation and wildlife resources would be expected to be about the same as for the proposed project. Commercial uses generate more solid waste per employee, but less wastewater and water demand than residential use per resident. The ultimate demand upon community services and utilities would depend on the size of the project.

The All Office/R&D/Commercial Development Alternative would generate impacts on housing demand (greater than the project as proposed), particularly in the Marin-Sonoma County area, that would not be mitigated in a manner similar to the proposed project, which provides for on-site housing. Removing housing from the site while the level of employment generating land uses remains constant would increase travel external to the site.

The All Office/R&D/Commercial Development alternative would not be consistent with the adopted Novato General Plan goals and policies for reuse of Hamilton Air Force Base.

6.3.3 REGIONAL SHOPPING CENTER

The Regional Shopping Center alternative would compete with the Northgate Shopping Center located in north San Rafael. Two regional shopping centers located within about three to four miles of each other may not be fiscally supportable in relation to the population being served, especially when considering the recently completed Villages shopping center and newly renovated and expanded Corte Madera shopping center, both located in Corte Madera about eight miles south of the project site. A regional shopping center at Hamilton Field may not be feasible from a financial standpoint, and a market study would be needed to support this conclusion. However, the project site is much larger than that needed for a regional shopping center and would not be a reasonable sole use of the land given the other possibilities for rental housing and renovation potential of existing structures. Additionally, this alternative would be in conflict with the City of Novato's efforts to redevelop downtown Novato as a major retail shopping area.

A regional shopping center would not generate significant traffic volumes during the morning peak hour. The greatest traffic impact would occur during the afternoon, and a slightly lighter impact would occur during the evening peak hour. Regional shopping centers with a gross leasable square footage over 1.25 million square feet have been observed to generate an average of 2.51 trips per thousand square feet during the evening peak hour. A 1.5 million square foot center would generate an estimated 3,800 evening peak-hour trips. However, an estimated 25% of those trips would pass the site because this percentage of traffic would be diverted from other trips and would impact roadways only at the main access points to the site.

This alternative would require a lower level of public service and utility use than the project as proposed. The Regional Shopping Center alternative would not be consistent with the adopted Novato General Plan goals and policies for reuse of Hamilton Air Force Base.

¹Section 15126 of the Guidelines for implementing the provisions of the Environmental Quality Act provide:

"(d) Describe a range of reasonable alternatives to the project, or to the location of the project, which could feasibly attain the basic objectives of the project, and evaluate the merits of the alternatives."

"(d) (5) The range of alternatives required in an EIR is governed by 'rule of reason' that requires the EIR to set forth only those alternatives necessary to permit a reasoned choice. The key issue is whether the selection and discussion of alternatives fosters informed decision-making and informed public participation. An EIR need not consider an alternative whose effect cannot be reasonably ascertained and whose implementation is remote and speculative."

²Analysis of the No-Project Alternative is required by CEQA. The State CEQA Guidelines (as amended, January 1984), state that "the key issue (in determining the range of alternatives required in an EIR), is whether the selection and discussion of alternatives fosters informed decision-making and informed public participation." (Section 15126 (d) (5)).

³Prior to development of the Land Use Plan, a number of relevant background studies were undertaken over extended periods of time. These studies are considered by Novato Planning Department staff as worthy of consideration as further refinements in the Hamilton Field Master Plan take place in the future. These studies include, but are not limited to:

Hamilton Air Force Base Reuse Options, VTN Consolidated Inc., March, 1976.

Comparative Feasibility Analysis of Alternative Property Development Plans for Hamilton Air Force Base, Report to County of Marin, May 10, 1977.

Final Environmental Impact Statement on Disposition and Use of Federal Surplus Property at Hamilton Air Force Base, U.S. General Services Administration, February, 1980.

An Environmental Assessment of Hamilton Reuse Plans, University of California CRS 133 Project, 1977.

Highway 101 Corridor Plan and Program: Phase I, 1984.

THE RELATIONSHIP BETWEEN
SHORT-TERM USES OF THE
ENVIRONMENT AND LONG-TERM
PRODUCTIVITY

7 THE RELATIONSHIP BETWEEN SHORT-TERM USES OF THE ENVIRONMENT AND LONG-TERM PRODUCTIVITY

The long-term impacts of the proposed project on environmental quality are important considerations with respect to long-term land use planning within Novato, and also, in Marin and Sonoma Counties. At the current time, site-specific detailed plans for the development of Hamilton Field have not been prepared and the current proposal is focused on broadly defined, long-term land use commitments. These commitments have been reviewed in the context of long-term public needs and goals, and those needs and goals would ultimately be determinants in defining the structure of the project, once all mitigations to reduce or avoid adverse environmental impacts would be fully implemented.

Long-term productivity can be related to the proposed project's characteristics and features. The project's economic productivity would be determined by its financial return to the City of Novato and County of Marin, and the money that would be spent in the region by those who would visit, live and work at Hamilton Field. Productivity with respect to serving the general public would be measured by the facilities of the project available for public use such as medical facilities, recreation opportunities, overnight accommodations and jobs provided by the project's employment generating land uses.

Development resulting from the proposed project would provide urbanized land uses in an area previously devoted to intense military use. Exceptions are noted with respect to wetland conditions and the alteration/replacement of wetlands (see Section 3.2.3, Vegetation and Wildlife). The project would be a long-term use, estimated at 75 years or more, covering the activities of several generations. Development of the site with the land uses proposed would generally preclude future options for other site uses in the actual areas of development. The project would not assist nor would it obstruct potential future civilian aviation use of the airstrip as discussed previously (see Section 3.1.1, Planning and Relationship to Plans). The project would have the cumulative and long-term effects of contributing to the depletion of natural resources of fossil fuels and contributing to traffic volumes on the streets in the area.

IRREVERSIBLE ENVIRONMENTAL
CHANGES THAT WOULD OCCUR
FROM IMPLEMENTATION OF THE
PROPOSED PROJECT

8 IRREVERSIBLE ENVIRONMENTAL CHANGES THAT WOULD OCCUR FROM IMPLEMENTATION OF THE PROPOSED PROJECT

The Hamilton Field project site represents a major resource value in Marin County wherein there is currently intense competition to develop the limited amounts of land not already committed for use. Characteristics unique to the property include its 452.1-acre size, access to major transportation corridors, existing buildings suitable for rehabilitation and reuse, the generally flat nature of the terrain that does not restrict development to the degree hillside areas would, existing infrastructure and the precedent of an earlier intensive use. The project site also represents an important opportunity to meet a variety of public and private objectives for the reuse of Hamilton Field (see Section 3.1.1, Planning and Relationship to Plans).

At the current time, the project site is not productively utilized. There are many abandoned and dilapidated buildings on the project site. There are also buildings capable of providing productive use that are now idle and there is land capable of being developed in conformance with the goals and objectives of the Novato General Plan. Project implementation would create changes in productivity, land use and visual character as defined in the respective sections of this EIR, and would be long-term extending well into the next century. Assuming land development and population growth expected for the future and the increased competition for land, it is doubtful that the Hamilton Field property would ever be returned to its natural condition, including the presence of baylands on the project site. The irreversible environmental changes which would take place are the commitment of non-renewable energy resources and of non-recyclable (by present technology) material resources used for the construction and operation of the proposed project. Any loss of significant archaeological resources would be irreversible.

9 REPORT PREPARATION

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APPENDIX

APPENDIX A
HISTORY OF HAMILTON FIELD



HISTORY OF HAMILTON FIELD¹

After an initial phase of early construction from 1931 through mid-1935, Hamilton Army Airfield became the headquarters of the 1st Pursuit Wing. The base was established in 1934 as a U.S. Army Air Corps installation. By 1940, the base housed over 4,000 officers and men of the 45th Air Base Group, 20th Pursuit Group, the 35th Pursuit Group and the 82nd Observation Squadron.

With the United States' entry into World War II, Hamilton Field was rapidly expanded to wartime status, with the construction of additional barracks, mess halls, administration buildings, warehouses, Link trainer buildings, schools, a hospital and other structures, an expansion that carried through to 1945, by which time World War II was nearing its end.

The Army Air Force was expanded into the United States Air Force after World War II ended as a separate military service, and Hamilton Field was modified to accommodate jet aircraft. In mid 1959, the runways were upgraded to accommodate F101 and F104 fighter operations. The base received a command redesignation from Air Defense Command to Aerospace Defense Command in 1968, and to the Air Force Reserve in 1973.

Decommissioning of Hamilton Field by the U.S. Air Force occurred in 1974. At that point, the Air Force made informal contact with other federal agencies to elicit interest in the transfer of Hamilton Field to such agencies. Following this, the Air Force indicated to the Department of Defense that no appropriate federal agencies had expressed an interest in acquiring the airstrip and support facilities.

In 1977, the Department of Defense screened military agencies with similar results. The exception was the Department of the Navy, which expressed a strong interest in acquiring the available housing units and related support activities. This was accomplished with the

necessary transfer of property maintenance obligations between the Air Force and Department of the Navy occurring as an internal accounting transfer within the Department of Defense.

The limited response to the Air Force and Department of Defense inquiries led to a Report of Excess by the Department of Defense stipulating that the remainder of the property at Hamilton Air Force Base, about 1,650 acres, was in excess of the Department of Defense needs. This triggered the General Services Administration (GSA) obligation to undertake a review and ultimate disposal of the property. In accordance with federal regulations, public aviation was given first consideration in disposal of the base.

In 1976, Marin County applied for use of the base as a public general aviation airport with related land to be developed for commercial and industrial uses to generate revenue to support the airport. The application was withdrawn by the County in 1979. Subsequently, the Port of Oakland began submission of an application for aviation facilities in late 1979. In mid-1980, the GSA rendered its Final Disposal Decision which denied the Port of Oakland application and transferred portions of the lowland areas to the U.S. Fish and Wildlife Service while offering the remainder of the property at Hamilton Air Force Base for sale to Marin County and the City of Novato at fair market value. A part of that decision preserved 5,000 feet of the existing 8,000-foot-long runway for five years so that a local determination could be made on the desirability of operating a general aviation facility. The Bay Conservation and Development Commission (BCDC), Metropolitan Transportation Commission (MTC) and Pacific Legal Foundation then filed suit in federal court challenging the GSA decision on a variety of causes of action. The runway facilities were then withdrawn from the disposal process.

In 1982, about 18 acres comprising the Lanham Village Housing Complex was released to the Ecumenical Association for Housing. In mid-1983, 755 acres of Hamilton property were formally transferred to the Army for active and reserve use, including the 8,000-foot runway and taxiways, a large portion of the lowland area north of the runway, and a large apron area around an aircraft hangar. About this time, the Navy submitted a request to the GSA for another 217 acres of property to meet the Navy's housing needs in the Bay Area. This left approximately 400 acres available for subsequent disposition by GSA for other uses.

During 1983 and early 1984, the City of Novato participated in a series of meetings identified as "The Hamilton Roundtable" attended by agencies interested in the disposition of the Hamilton properties. In addition to the City of Novato, participants included the County of Marin, the Port of Oakland, MTC, BCDC, the Aircraft Owners and Pilots Association, the Marin Coalition and state and federal government officials. The purpose of the discussions was to determine whether civilian aviation use could be accommodated at Hamilton and to settle the litigation involving the disposition of base facilities.

As a result of the Roundtable discussions and activities, a list of airport controls to minimize the impacts of airport operations on the community were developed. Further steps to provide information on the costs and benefits of operating a public general aviation airport under a joint-use agreement with the Army were detailed. In March of 1984, the Novato City Council voted to prepare an application to the Army for joint use. The Resolution formed the basis for a 1984 November ballot initiative to allow general aviation use of Hamilton Field. The initiative was subsequently defeated by the qualified voters of Novato. In March of 1985, the remaining properties at Hamilton Field were offered at auction by GSA. The \$45,000,000 bid submitted by the Berg-Revoir Corporation was the successful bid leading to plans for the eventual transfer of title to this Corporation.

The 755 acres of Hamilton Air Force Base property transferred to the Army officially became the Hamilton Army Airfield (HAAF) in July of 1984. HAAF is classified as a subinstallation of the Presidio of San Francisco, with overall responsibility for command and control of HAAF resting with the Directorate of Plans, Training and Security. The Directorate Aviation Division is responsible for the airfield and aviation areas.

Current aviation use of HAAF is limited to Army and Coast Guard operations. Active Army and Army reserve units continue to use Hamilton Field, and the mission of HAAF will reflect support for Army aviation. The Army will continue to maintain one active disaster response unit and two reserve units with about 25 fixed-wing aircraft and helicopters based at HAAF. The Coast Guard's Pacific Coast Strike Team, an oil spill emergency clean-up group, uses two hangars previously owned by the Army. In addition, the Coast Guard's support of the Law Enforcement and Search and Rescue programs results in approximately 160 annual operations of C-130, Falcon turbojet aircraft and Coast Guard helicopters.

¹Material for Appendix A, History of Hamilton Field was taken from the following sources:

U.S. General Services Administration, Draft Environmental Impact Statement on Disposition and Use of Federal Surplus Property at Hamilton Air Force Base, Novato, California, April, 1979.

Turner Collie & Braden, Inc., Environmental Assessment and Environmental Impact Report on Joint Military/Civilian General Aviation Use of Hamilton Army Airfield, Novato, California, October 19, 1984.

Armed Services Enlisted Widows Homes Foundation, Inc., letter of February 8, 1986 from George R. Mohr, Chairman, Board of Directors, to Novato Planning Commission.

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